Project No. 1251-100
Crude Oil Tank Farms Project, Agrood Area 30 (Module-1)

PETROJET | Enppi | EGPC

System ID	030-EL-018
System Description	Electrical Power Module-2 System

Sr.	Pre-Commissioning and Commissioning Dossier Index	Applicable (Yes/No)
1	Mechanical Completion Certificate (MCC)	
2	Ready for Startup Certificate (RFSU)	
3	System Punch Lists	
4	System Limits Marked Up P&ID	
5	System Index	
6	Piping Pre-Commissioning	
	6.01) Piping Test Packs	
	6.02) Piping Pre-commissioning Check Lists	
7	Piping Commissioning	
	7.01) Service Test, GLT, CLT and N2 Purging Certificates	
	7.02) Piping Commissioning Check Lists	

Sr.	Pre-Commissioning and Commissioning Dossier Index	Applicable (Yes/No)
8	Mechanical Pre-Commissioning	
	8.01) System Mechanical Index	
	8.02) Equipment Drawings	
	8.03) Equipment Datasheets	
	8.04) Boxing-up Certificates	

	8.05) Grouting Certificates	
	8.06) Pre-Alignment Certificates	
	8.07) Mechanical Pre-Commissioning Checklists	
9	**Mechanical Commissioning**	
	9.01) Final Alignment Certificates	
	9.02) Motor Solo Run Certificates	
	9.03) Mechanical Run Test (MRT) Certificates	
	9.04) Mechanical Commissioning Checklists	
	9.05) Mechanical Supplier Check Lists & Reports	
10	**Instrumentation Pre-Commissioning**	
	10.01) System Instrument Index	
	10.02) Instrument Data Sheets	
	10.03) Instrument Cable Schedule	
	10.04) System Instrumentation Wiring Diagram	
	10.05) Hook-up Drawing (Mechanical & Pneumatic)	
	10.06) Instruments Cables Schedule	
	10.07) Instruments Cables Laying Certificates	
	10.08) Instruments Cables Termination Certificates	
	10.09) Instruments Cables Testing Certificates	
	10.10) Instruments Calibration Certificates	
	10.11) Instrument Loop Checks Certificates	
	10.12) Instrumentation Pre-Commissioning Check Lists	
	10.13) Instrumentation Supplier Check Lists & Reports	
11	**Instrumentation Commissioning**	
	11.01) Instrumentation Function Test Certificates	
	11.02) Instrumentation Supplier Check Lists & Reports	
Sr.	**Pre-Commissioning and Commissioning Dossier Index**	**Applicable (Yes/No)**
12	**Electrical Pre-Commissioning**	
	12.01) System Electrical Index	
	12.02) Electrical Drawings	
	12.03) Motor Datasheets	
	12.04) Electrical Cables Schedule	
	12.05) Electrical Cables Laying Certificates	
	12.06) Electrical Cables Testing Certificates	
	12.07) Electrical Cables Termination Certificates	
	12.08) FAT Reports & Certificates	
	12.09) SAT Reports & Certificates	
	12.10) Electrical Pre-Commissioning Check Lists	
	12.11) Electrical Supplier Check Lists & Reports	

13	**Electrical Commissioning**	
	13.01) Electrical -Commissioning Check Lists	
	13.02) Electrical Supplier Check Lists & Reports	
14	**Red Marked-up Drawings**	
	14.01) P&ID	
	14.02) Instrumentation Drawings	
	14.03) Electrical Drawings	

System ID	030-EL-018
System Description	Electrical Power Module-2 System

1-Mechanical Completion Certificate (MCC)

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SYSTEM MECHANICAL COMPLETION CERTIFICATE (MCC)

PROJECT TITLE	:	CRUDE OIL TANK FARM PROJECT (AGROOD AREA)
PROJECT No	:	01251-100
SYSTEM NAME	:	Electrical Power Module-2 System
SYSTEM ID	:	030-EL-018

THIS IS TO CERTIFY THAT:

- **THE ABOVE SYSTEM HAS BEEN FABRICATED, ERECTED, INSTALLED AND TESTED TO THE REQUIREMENTS OF THE CONTRACT DRAWINGS, SPECIFICATIONS, THE APPLICABLE CODES AND STANDARDS.**
- **ALL PRE-COMMISSIONING RELEVANT ACTIVITIES, TESTS, INSPECTIONS AND CHECKS HAVE BEEN CARRIED OUT FOR THIS SYSTEM AND FOUND ACCEPTABLE.**
- **Q/C DOCUMENTATION OF THE ABOVE SYSTEM HAS BEEN AUDITED BY THE CUSTOMER SITE QUALITY CONTROL AND FOUND COMPLETED.**
- **ALL PUNCH LIST ITEMS CATEGORY (A) IN THIS SUBSYSTEM WERE CLEARED.**
- **THIS SYTEM IS MECHANICALLY COMPLETED ON THE DATE AND READY FOR COMMISSIONING (RFC) WITH THE FOLLOWING EXCEPTIONS.**

EXCEPTIONS :

COMPANY	PETROJET	ENPPI	PMC
NAME	Sobhy Seleem	Mohamed Abbas	
TITLE	QC E&I engineer		
SIGNATURE	[signature]	[signature]	[signature]
DATE	25/7/2021		

System ID	030-EL-018
System Description	Electrical Power Module-2 System

2- Ready for Startup Certificate (RFSU)

PETROJET Enppi EGPC

READY FOR START UP CERTIFICATE

PROJECT TITLE	: EGPC CRUDE OIL TANK FARMS PROJECT (AGROOD-02)
PROJECT No.	: 1251-100
SYSTEM /AREA /PLANT	: Electrical Power Module-2 System
SYSTEM /AREA /PLANT No.	: 030-EL-018

THIS IS TO CERTIFY THAT:

- THE MENTIONED SYSTEM /AREA /PLANT IS READY FOR START UP WHERE ALL MECHANICAL WORKS, PRECOMMISSIONING AND COMMISSIONING ACTIVITIES HAVE BEEN SUCCESSFULLY COMPLETED.
- MECHANICAL COMPLETION CERTIFICATE(S) FOR THE MENTIONED SYSTEM / AREA / PLANT HAVE BEEN SIGNED.
- ISSUANCE OF THIS READY FOR START UP CERTIFICATE(S) SHALL NOT RELIEVE CONTRACTOR(S) FROM THEIR OBLIGATIONS TO COMPLETE THE REMAINING SYSTEMS NOR FROM THEIR WARRANTY OBLIGATIONS AND OTHER PROVISIONS OF THE CONTRACT.
- THE FOLLOWING EXCEPTIONS AGREED TO BE CLEARED AFTER START UP AND WILL NOT PREVENT START UP ACTIVITIES.

EXCEPTIONS :

COMPANY	CONSORTIUM	PPC
NAME	Ahmed El Shafie	Mohamed Ibrahim
TITLE	Commissioning Manager	E. engineering
SIGNATURE	Shafi	[signature]
DATE	3-8-2021	18-8-2021

10000-000-EK8-FRM-0006 (03/15)

System ID	030-EL-018
System Description	Electrical Power Module-2 System

3- System Punch Lists

Enppi

PUNCH LIST

PROJECT TITLE	: CRUDE OIL TANK FARM(AGROOD AREA		
PROJECT NUMBER	: 1251-100	DISCIPLINE	:
SYSTEM NAME	: Electrical Power Module-2 System	SYSTEM ID	: 030-EL-18
SUB-SYSTEM NAME	:	SUB-SYSTEM ID	:

No	DESCRIPTION	CAT	ACTION BY	DISP	CLEARANCE APPROVED BY
1	Earthing to be installed and tested	A	PTJ	elec	[signature]
2	Cable tray Covers to be Installed Cancel	B	PTJ	elec	Cancel.
3	Mct for all Cables to be Installed	B	Enppi/PTJ	elec	
4	Earthing bit to be Installed	C	PTJ	elec	[signature]
5	lightining system to be Connected to the earthing System	A	PTJ	elec	[signature]
6	Cable trench to be backfailed with soft sand under the power module	B	PTJ	elec	[signature]
7	Access for the doors of Power module to be Installed	B	PTJ	Civil	
8	Stair foundation to be done	B	PTJ	Civil	[signature]

CAT: CATEGORY (A,B,C) , ACTION BY: (ENPPI, CONST. CONTRACTOR, SUPPLIER...), DISP: DISCIPLINE (PIP, MECH, ELECT, INST...)

COMPANY	PETROJET	ENPPI	~~SUMED~~ PMC
NAME	Sobhy Seleam	Islam Sherif	
SIGNATURE	[signature]	[signature]	[signature]
DATE			

System ID	030-EL-018
System Description	Electrical Power Module-2 System

4- System Limits Marked Up P&ID

System ID	030-EL-018
System Description	Electrical Power Module-2 System

5- System Index

System ID	030-EL-018
System Description	Electrical Power Module-2 System

6- Piping Pre-Commissioning

System ID	030-EL-018
System Description	Electrical Power Module-2 System

6.01- Piping Test Packs

System ID	030-EL-018
System Description	Electrical Power Module-2 System

6.02- Piping Pre-commissioning Check Lists

System ID	030-EL-018
System Description	Electrical Power Module-2 System

7- Piping Commissioning

System ID	030-EL-018
System Description	Electrical Power Module-2 System

7.01- Service Test, GLT, CLT and N2 Purging Certificates

System ID	030-EL-018
System Description	Electrical Power Module-2 System

7.02- Piping Commissioning Check Lists

System ID	030-EL-018
System Description	Electrical Power Module-2 System

8- Mechanical pre-Commissioning

System ID	030-EL-018
System Description	Electrical Power Module-2 System

8.01- System Mechanical Index

System ID	030-EL-018
System Description	Electrical Power Module-2 System

8.02- Equipment Drawings

System ID	030-EL-018
System Description	Electrical Power Module-2 System

8.03- Equipment Datasheets

System ID	030-EL-018
System Description	Electrical Power Module-2 System

8.04- Boxing-up Certificates

System ID	030-EL-018
System Description	Electrical Power Module-2 System

8.05- Grouting Certificates

System ID	030-EL-018
System Description	Electrical Power Module-2 System

8.06- Pre-Alignment Certificates

System ID	030-EL-018
System Description	Electrical Power Module-2 System

8.07- Mechanical Pre-Commissioning Checklists

System ID	030-EL-018
System Description	Electrical Power Module-2 System

9- Mechanical Commissioning

Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)

System ID	030-EL-018
System Description	Electrical Power Module-2 System

9.01- Final Alignment Certificates

System ID	030-EL-018
System Description	Electrical Power Module-2 System

9.02- Motor Solo Run Certificates

System ID	030-EL-018
System Description	Electrical Power Module-2 System

9.03- Mechanical Run Test (MRT) Certificates

9.04- Mechanical Commissioning Checklists

System ID	030-EL-018
System Description	Electrical Power Module-2 System

9.05- Mechanical Supplier Check Lists & Reports

System ID	030-EL-018
System Description	Electrical Power Module-2 System

10- Instrumentation Pre-Commissioning

System ID	030-EL-018
System Description	Electrical Power Module-2 System

10.01- System Instrument Index

System ID	030-EL-018
System Description	Electrical Power Module-2 System

10.02- Instrument Data Sheets

System ID	030-EL-018
System Description	Electrical Power Module-2 System

10.03- Instrument Cable Schedule

System ID	030-EL-018
System Description	Electrical Power Module-2 System

10.04- System Instrumentation Wiring Diagram

System ID	030-EL-018
System Description	Electrical Power Module-2 System

10.05- Hook-up Drawing (Mechanical & Pneumatic)

System ID	030-EL-018
System Description	Electrical Power Module-2 System

10.06- Instruments Cables Schedule

Enppi PETROJET بتروجت

Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)

Petroleum Pipelines Company شركة أنابيب البترول

System ID	030-EL-018
System Description	Electrical Power Module-2 System

10.07- Instruments Cables Laying Certificates

System ID	030-EL-018
System Description	Electrical Power Module-2 System

10.08- Instruments Cables Termination Certificates

System ID	030-EL-018
System Description	Electrical Power Module-2 System

10.09- Instruments Cables Testing Certificates

System ID	030-EL-018
System Description	Electrical Power Module-2 System

10.10- Instruments Calibration Certificates

System ID	030-EL-018
System Description	Electrical Power Module-2 System

10.11- Instrument Loop Checks Certificates

System ID	030-EL-018
System Description	Electrical Power Module-2 System

10.12- Instrumentation Pre-Commissioning Check Lists

System ID	030-EL-018
System Description	Electrical Power Module-2 System

10.13- Instrumentation Supplier Check Lists & Reports

11- Instrumentation Commissioning

System ID	030-EL-018
System Description	Electrical Power Module-2 System

11.01) Instrumentation Function Test Certificates

System ID	030-EL-018
System Description	Electrical Power Module-2 System

11.02- Instrumentation Supplier Check Lists & Reports

System ID	030-EL-018
System Description	Electrical Power Module-2 System

12- Electrical Pre-Commissioning

System ID	030-EL-018
System Description	Electrical Power Module-2 System

12.01- System Electrical Index

	Electrical Power Module-2 System	Electrical	P-030-EPM2-TR-1	HV Cable	Checklist	EL-31 A
030-EL-018	Electrical Power Module-2 System	Electrical	C-030-EPM2-LVSWG	LV Cable	Checklist	EL-31 A
030-EL-018	Electrical Power Module-2 System	Electrical	P-030-EPM2-DP-2	LV Cable	Checklist	EL-31 A
030-EL-018	Electrical Power Module-2 System	Electrical	P-030-EPM2-UPDP-1	LV Cable	Checklist	EL-31 A

System ID	030-EL-018
System Description	Electrical Power Module-2 System

12.02- Electrical Drawings

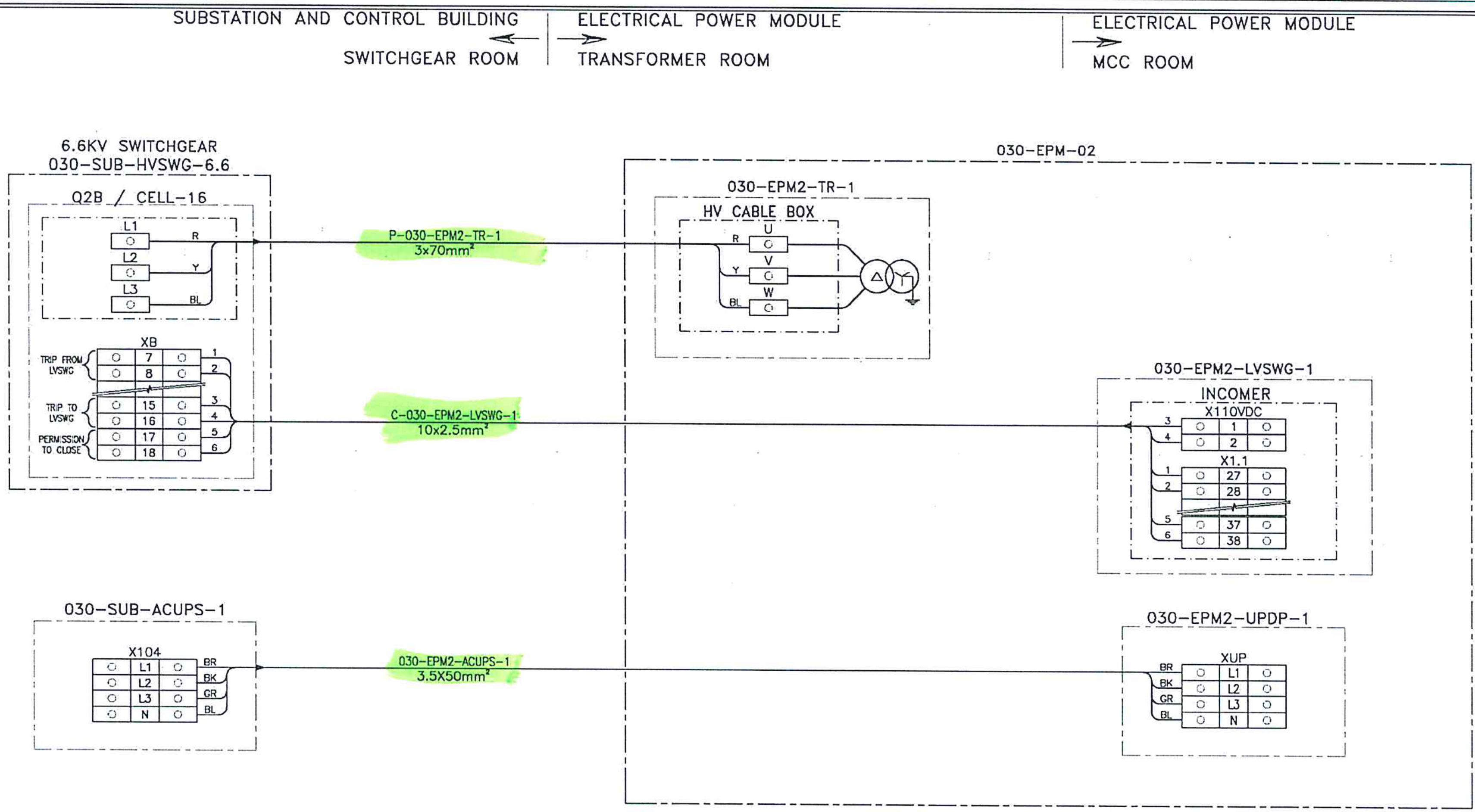
System ID	030-EL-018
System Description	Electrical Power Module-2 System

12.03- Motor Datasheets

System ID	030-EL-018
System Description	Electrical Power Module-2 System

12.04- Electrical Cables Schedule

AGE+A1:L3	Cable Mark	GL1	FROM	TO	GL2	CABLEService	Service Voltage	KW	Size	Type	L
47	P-030-EPM2-TR-1	WP	030-SUB-HVSWG-6.6 (Q2B)	030-EPM2-TR-1	WP	HV POWER FEEDER	6600VAC	500	3x70	3A	650
47	C-030-EPM2-LVSWG	WP	030-EPM2-LVSWG (A1.1)	030-SUB-HVSWG-6.6 (Q2B)	WP	INTERTRIP			10x2.5	C1	650
47	P-030-EPM2-UPDP-1	WP	030-SUB-ACUPS-1	030-EPM2-UPDP-1	WP	3PH POWER FEEDER	400VAC	5.0	3.5x50	4B	650
48	P-030-EPM2-DP-2	WP	030-EPM2-LVSWG-1 (A2.2)	030-EPM2-DP-2	WP	3PH POWER FEEDER	400VAC	40	4x25		



NOTICE

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EGPC
THE EGYPTIAN GENERAL PETROLEUM CO.
الهيئة العامة المصرية للبترول
EGPC

FOR : THE EGYPTIAN GENERAL PETROLEUM CORPORATION (EGPC) — لاجـل الهيئة العامة المصرية للبترول

AT : AGROOD — الموقع: عجرود السويس

EGPC CRUDE OIL TANK FARM
AGROOD AREA (MODULE-1)
ELECTRICAL INTERCONNECTION & WIRING DIAGRAM
FEEDERS TO ELECTRICAL POWER MODULE-2
(030-EPM-2)

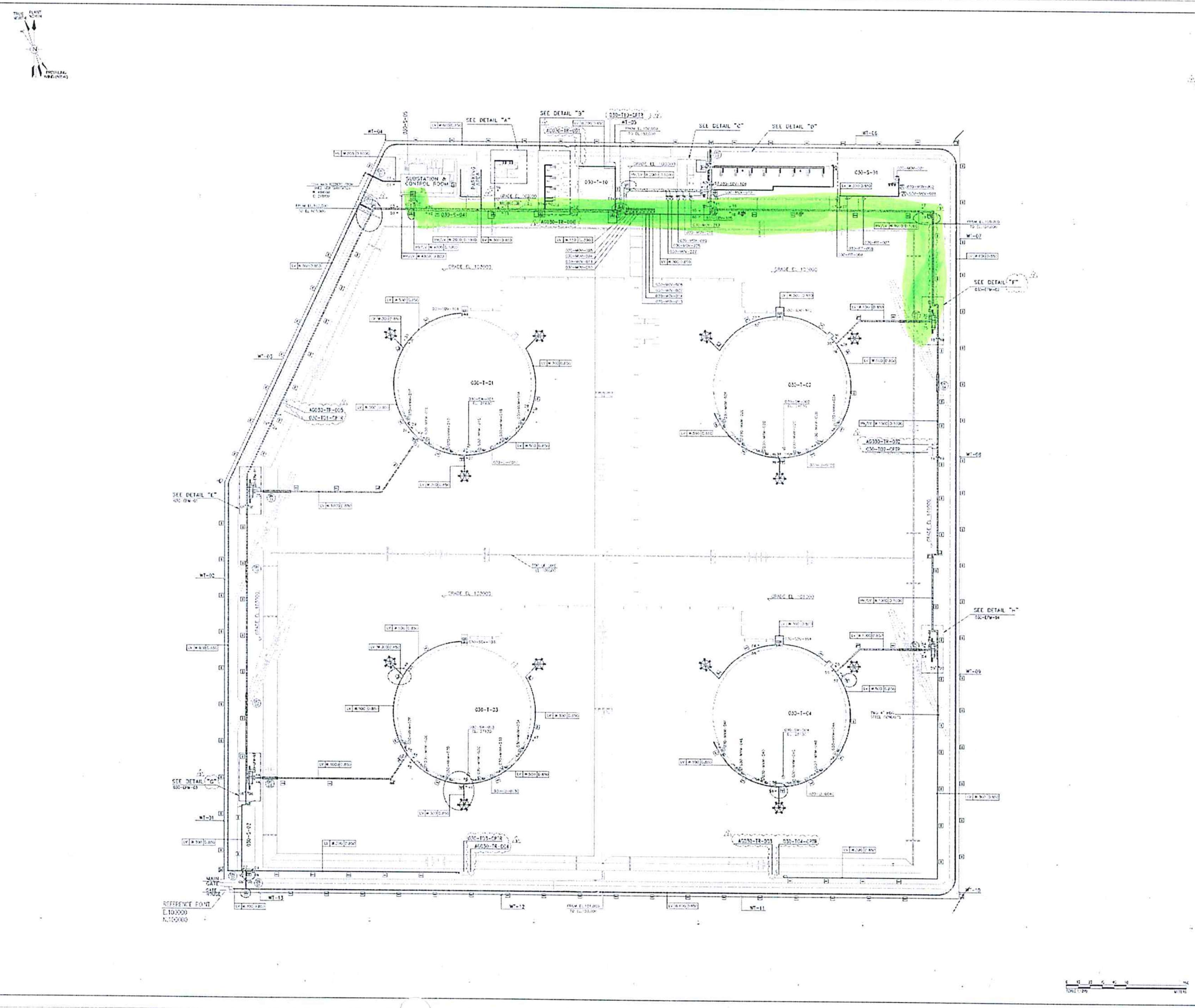
الشركه الهندسية للصناعات البترولية والكيماوية
Enppi إنبي
ENGINEERING FOR THE PETROLEUM AND PROCESS INDUSTRIES

SCALE	DOCUMENT NUMBER	SHEET	REVISION
NONE	01251-100-030-EWI-001	054 OF 078	0

A3 SIZE: 297 X 420

System ID	030-EL-018
System Description	Electrical Power Module-2 System

12.05- Electrical Cables Laying Certificates



REFERENCE DRAWINGS AND DOCUMENTS

LEGEND

IDENTIFICATION

NOTES

1. FOR NOTES SEE SHEET 2 OF 2.

KEY PLAN

EGPC

THE EGYPTIAN GENERAL PETROLEUM CO.

الهيئة المصرية العامة للبترول

EGPC CRUDE OIL TANK FARM
AGROOD AREA (MODULE-1)
OUTDOOR ELECTRICAL CABLE ROUTING LAYOUT

Enppi إنبي

ENGINEERING FOR THE PETROLEUM AND PROCESS INDUSTRIES

SCALE	ENPPI DRAWING NUMBER	SHEET	REVISION
1:1000	01251-100-030-ECL-001	01/02	3

System ID	030-EL-018
System Description	Electrical Power Module-2 System

12.06- Electrical Cables Testing Certificates

Enppi	EGPC CRUDE OIL TANK FARM	EGPC

INSPECTION AND TEST REPORT FOR

CABLE INSULATION RESISTANCE TEST

SYSTEM NO.:

INSPECTION REPORT NUMBER	INSPECTION DATE & TIME	DOUCUMENT No.	DISPLINE	SHEET NO
RFI-~~IT~~ 206		ITR-EL-0006A	ELECTRICAL	

INSTRUMENT TYPE:	SERIAL:	SERVICE VOLTAGE:	TEST VOLTAGE:	AREA / PACKAGE:
		~~220~~ 6K.V	5kv	

NO	Item/Tag NO.	CABLE SIZE	Continuity Test	PHASE TO PHASE "M.Ohm"			PHASE TO NUETRAL "M.Ohm"			PHASES & NUETRAL TO ARMOR "M.Ohm"				RESULT	
				BR-BK	BR-GR	BK-GR	BR-B	BK-B	GR-B	BR-ARM	BK-ARM	GR-ARM	B-ARM	Pass	FAIL
1	P/1-030-SUB-PTR-1A	3x95	✓				ok							✓	
2	P/2-030-SUB-PTR-1A	3x95	✓				ok							✓	
3	P/3-030-SUB-PTR-1A	3x95	✓				ok							✓	
4	G1-030-SUB-NER-1A	1x95	✓				ok							✓	
5	P/1-030-SUB-PTR-1B	3x95	✓				ok							✓	
6	P/2-030-SUB-PTR-1B	3x95	✓				ok							✓	
7	P/3-030-SUB-PTR-1B	3x95	✓				ok							✓	
8	G1-030-SUB-NER-1B	1x95	✓				ok							✓	
9	P/1-030-SUB-HVSWG-6.6A	3x95	✓				ok							✓	
10	P/2-030-SUB-HVSWG-6.6A	3x95	✓				ok							✓	
11	P/3-030-SUB-HVSWG-6.6A	3x95	✓				ok							✓	
12	P/4-030-SUB-HVSWG-6.6A	3x95	✓				ok							✓	
13	P/1-030-SUB-HVSWG-6.6B	3x95	✓				ok							✓	
14	P/2-030-SUB-HVSWG-6.6B	3x95	✓				ok							✓	
15	P/3-030-SUB-HVSWG-6.6B	3x95	✓				ok							✓	
16	P/4-030-SUB-HVSWG-6.6B	3x95	✓				ok							✓	
17	P-030-SUB-TR-1A	3x70	✓				ok							✓	
18	P-030-SUB-TR-1B	3x70	✓				ok							✓	
19	P-030-EPM2-TR-1	3x70	✓				ok							✓	

Remarks :-

Referance :-

	PETROJET	ENPPI	PMC
NAME :			
SIGNATURE	[signature]	Islam Sherif [signature]	M. Omar
DATE			

Enppi PETROJET

EGPC CRUDE OIL TANK FARM

EGPC

INSPECTION AND TEST REPORT FOR

HI POT INSULATION TEST

INSPECTION REPORT NUMBER	INSPECTION DATE & TIME	ITR NUMBER	SYSTEM NO.: DISPLINE	SHEET NO
RFI-206		ITR-EL-0008		1 OF 1

Item/Tag NO.					
Type :-		Core:		Size:	

NO.	Description of check	RESUNT ACCEPT	REJECT	N/A.
1	No damage of cable has found and maintain insulation resistance	✓		
2	Correct cable type/size/ installed as per approved drawing	✓		
3	Calibration test certificate of testing equipment to be checked.	✓		

Continuity Test : ☑ ACCEPT ☐ REJECT ☐ N/A.

Test Equipment List

INSTRUMENT TYPE:	SERIAL:	SERVICE VOLTAGE:	TEST VOLTAGE:	

Insulation Resistance Test MΩ

PHASE TO PHASE			PHASES TO ARMOR		
BR-BK	BR-GR	BR-GR	BR-ARM	BK-ARM	GR-ARM
ol	ol	ol	ol	ol	ol

Hi-Pot test

Phase BR Test Voltage (.11.. kV)

Phase	TEST VOLTAGE	TIME	CURRENT	
ARM,BK,GR_BR		15 Min	385 MA	

Phase BK Test Voltage (..11.. kV)

Phase	TEST VOLTAGE	TIME	CURRENT	
ARM,BR,GR_BK		15 Min	405 MA	

Phase GR Test Voltage (.11.. kV)

Phase	TEST VOLTAGE	TIME	CURRENT	
ARM,BR,BK_GR		15 Min	310 MA	

Insulation Resistance Test MΩ

PHASE TO PHASE			PHASES TO ARMOR		
BR-BK	BR-GR	BR-GR	BR-ARM	BK-ARM	GR-ARM

Remarks :

INSPECTION RESULTS: ☑ APPROVEI ☐ REJECT ☐ APPROVED W/ COMMENT

	PETROJET	ENPPI	PMC
NAME :		Islam Sherif	
SIGNATURE	[signature]	[signature]	M. omar
DATE			

Enppi

EGPC CRUDE OIL TANK FARM

EGPC

INSPECTION AND TEST REPORT FOR

CABLE INSULATION RESISTANCE TEST

INSPECTION REPORT NUMBER PTJ-ELE-RFI- 165	INSPECTION DATE & TIME 05/04/2021	DOUCUMENT No. ITR-EL-0006A	DISPLINE ELECTRICAL	SYSTEM NO.:	SHEET NO
INSTRUMENT TYPE: HIGH VOLTAGE INSULATION TESTER-SANWA-MG5000	SERIAL: 17015900385	SERVICE VOLTAGE: 400	TEST VOLTAGE: 1000	AREA / PACKAGE: SUBSTATION	

NO	Item/Tag NO.	CABLE SIZE	Continuity Test	PHASE TO PHASE			PHASE TO NUETRAL"M.Ohm"			PHASES & NUETRAL TO ARMOR "M.Ohm"				RESULT	
				BR-BK	BR-GR	BK-GR	BR-B	BK-B	GR-B	BR-ARM	BK-ARM	GR-ARM	B-ARM	Pass	FAIL
1	P-030-EPM2-UPDP-1	3.5x50	✓	O.L	O.L	O.L								✓	
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															

Remarks :-

Referance :-

	PETROJET	ENPPI	PMC
NAME :			
SIGNATURE	[signature]	[signature]	[signature]
DATE			

Enppi PETROJET

EGPC CRUDE OIL TANK FARM

EGPC

INSPECTION AND TEST REPORT FOR

CABLE INSULATION RESISTANCE TEST

SYSTEM NO.:

INSPECTION REPORT NUMBER	INSPECTION DATE & TIME	DOUCUMENT No.	DISPLINE	SHEET NO
PTJ-ELE-RFI- 165	05/04/2021	ITR-EL-0006B	ELEC	

INSTRUMENT TYPE:	SERIAL:	SERVICE VOLTAGE:	TEST VOLTAGE:	AREA / PACKAGE:
HIGH VOLTAGE INSULATION TESTER-SANWA-MG5000	17015900385	24	500	

NO	Item/Tag NO.	CABLE SIZE	Continuity Test	pair conductors	conductors to armor	Shield to Shield	All Conductors-GND	Overall Shield -GND	Armor -GND	RESULT Pass	RESULT FAIL
1	C-030-EPM2-LVSWG	10x2.5	✓	O.L				> 500 MΩ		✓	
2	C2-030-MXM-02A	12x2.5	✓	O.L				> 500 MΩ		✓	
3	C2-030-MXM-02B	12x2.5	✓	O.L				>500 MΩ		✓	
4	C2-030-MXM-02C	12x2.5	✓	O.L				>500 MΩ		✓	
5	C2-030-MXM-02D	12x2.5	✓	O.L				>500 MΩ		✓	
6	C2-030-MXM-02E	12x2.5	✓	O.L				>500 MΩ		✓	
7	C2-030-MXM-02F	12x2.5	✓	O.L				>500 MΩ		✓	
8											
9											
10											
11											
12											

Remarks :-

Referance

	PETROJET	ENPPI	PMC
NAME :			
SIGNATURE	[signature]	[signature]	[signature]
DATE			

System ID	030-EL-018
System Description	Electrical Power Module-2 System

12.07- Electrical Cables Termination Certificates

Enppi

EGPC CRUDE OIL TANK FARM

EGPC

Owner :	Egyptian General Petroleum Corporation (EGPC)	Project No: 01251-100-030 :01251-100-031
Contractor	CONSORTIUM (ENPPI / PETROJET)	Document No: ITR-QC-0001 Revision No. : 00

REQUEST FOR INSPECTION

ACTIVITY : CABLE TERMINATION AND TEST

NOTIFICATION NO. : PTJ-ELE-RFI- 165 DISCIPLINE : ELEC

DATE : 05/04/2021

NO.	DESCRIPTION	LOCATION	DATE / TIME	INSPECTION			REMARKS
				PETROJET	ENPPI	PMC	
1	C-030-EPM2-LVSWG	SUBSTATION					
2	C2-030-MXM-02A	SUBSTATION					
3	C2-030-MXM-02B	SUBSTATION					
4	C2-030-MXM-02C	SUBSTATION					
5	C2-030-MXM-02D	SUBSTATION					
6	C2-030-MXM-02E	SUBSTATION					
7	C2-030-MXM-02F	SUBSTATION					
8	P-030-EPM2-UPDP-1	SUBSTATION					
9							
10							
11							
12							
13							
14							
15							
16							
17							

NOTE:

Inspection result : A - Approved B - Reject C - Approved with Comment

	PETROJET	ENPPI	PMC
NAME :			
SIGNATURE	[signature]	[signature]	[signature]
DATE			

Enppi PETROJET

EGPC CRUDE OIL TANK FARM

EGPC

INSPECTION AND TEST REPORT FOR

CABLE TERMINATION AND SPLICING

SYSTEM NO.:

INSPECTION REPORT NUMBER	INSPECTION DATE & TIME	ITR NUMBER	DISPLINE	SHEET NO
PTJ-ELE-RFI- 169	05/04/2021	ITR-EL-0009	ELEC	1 OF 1

Item/Tag NO.	For All Cables tages in PTJ-ELE-RFI-				
Type :-		Core:		Size:	

NO.	Description of check	RESUNT ACCEPT	REJECT	N/A.
1	Check cable glands are correct type and size as per cable schedule.	✓		
2	Check there are no damages to cores, termination chamber layout is satisfactory, core identification is correct, crimped and pins satisfactory.	✓		
3	Check cable tag is done correctly.	✓		
4	Test and confirm conductor, phase continuity.	✓		
5	Check insulation resistance test (megger) is completed *'	✓		
6	Check Hi-pot test is completed, only for MV/HV cables *"			✓
7	Connect all cores at both ends and confirm all connections are correct as per termination diagram.	✓		
8	Confirm spare cores, screens are earthed and conform to design drawings/specifications	✓		
9	Check enclosure cover is installed , no damages and no bolts are missing	✓		
10	Calibration test certificate of testing equipment to be checked.	✓		

Remarks :

*' : ITR-EL-006A/B

*" :ITR-EL-008

	PETROJET	ENPPI	PMC
NAME :			
SIGNATURE	[signature]	[signature]	[signature]
DATE			

Enppi PETROJET

EGPC CRUDE OIL TANK FARM

EGPC

Owner :	Egyptian General Petroleum Corporation (EGPC)	Project No: 01251-100-030 :01251-100-031
Contractor	CONSORTIUM (ENPPI / PETROJET)	Document No: ITR-QC-0001 Revision No. : 00

REQUEST FOR INSPECTION

ACTIVITY : CABLE TERMINATION AND SPLICING

NOTIFICATION NO. : PTJ-INS-RFI- 206 DISCIPLINE : E&I

DATE : 5/24/2021

NO.	DESCRIPTION	LOCATION	DATE / TIME	INSPECTION			REMARKS
				PETROJET	ENPPI	PMC	
	CABLE TERMINATIN AND SPLICING	MODULE 1	24-May-21				
1	P/1-030-SUB-PTR-1A						
2	P/2-030-SUB-PTR-1A						
3	P/3-030-SUB-PTR-1A						
4	G1-030-SUB-NER-1A						
5	P/1-030-SUB-PTR-1B						
6	P/2-030-SUB-PTR-1B						
7	P/3-030-SUB-PTR-1B						
8	G1-030-SUB-NER-1B						
9	P/1-030-SUB-HVSWG-6.6A						
10	P/2-030-SUB-HVSWG-6.6A						
11	P/3-030-SUB-HVSWG-6.6A						
12	P/4-030-SUB-HVSWG-6.6A						
13	P/1-030-SUB-HVSWG-6.6B						
14	P/2-030-SUB-HVSWG-6.6B						
15	P/3-030-SUB-HVSWG-6.6B						
16	P/4-030-SUB-HVSWG-6.6B						
17	P-030-SUB-TR-1A						
18	P-030-SUB-TR-1B						
19	P-030-EPM2-TR-1						

NOTE:

Inspection result : A - Approved B - Reject C - Approved with Comment

	PETROJET	ENPPI	PMC
NAME :			
SIGNATURE	[signature]	[signature]	M. Omar
DATE			

Enppi PETROJET

EGPC CRUDE OIL TANK FARM

EGPC

INSPECTION AND TEST REPORT FOR

CABLE TERMINATION AND SPLICING

SYSTEM NO.:				
INSPECTION REPORT NUMBER	INSPECTION DATE & TIME	ITR NUMBER	DISPLINE	SHEET NO
RFI-206		ITR-EL-0009	ELEC	1 OF 1

Item/Tag NO.					
Type :-		Core:		Size:	

NO.	Description of check	RESUNT		
		ACCEPT	REJECT	N/A.
1	Check cable glands are correct type and size as per cable schedule.	✓		
2	Check there are no damages to cores, termination chamber layout is satisfactory, core identification is correct, crimped and pins satisfactory.	✓		
3	Check cable tag is done correctly.	✓		
4	Test and confirm conductor, phase continuity.	✓		
5	Check insulation resistance test (megger) is completed *'	✓		
6	Check Hi-pot test is completed, only for MV/HV cables *''	✓		
7	Connect all cores at both ends and confirm all connections are correct as per termination diagram.	✓		
8	Confirm spare cores, screens are earthed and conform to design drawings/specifications			✓
9	Check enclosure cover is installed , no damages and no bolts are missing	✓		
10	Calibration test certificate of testing equipment to be checked.	✓		

Remarks :

....

....

....

	PETROJET	ENPPI	PMC
NAME :		Islam Sherif	
SIGNATURE	[signature]	[signature]	M. omar
DATE			

System ID	030-EL-018
System Description	Electrical Power Module-2 System

12.08- FAT Reports & Certificates

System ID	030-EL-018
System Description	Electrical Power Module-2 System

12.09- SAT Reports & Certificates

Enppi	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	CEAR COSTRUZIONI ELETTROTECNICHE CEAR s.r.l.

30 E-018

CRUDE OIL TANK FARM
1251-100

EPM MODULE 030-EPM2

SAT

Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved
Notes:			EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.				
			Contract Number: 1251-100-500-16				
			Enppi Ref.: 01251-100-S07-P06-0001 R.1				
				Language: E		Total Pages: 19	

INDEX

INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the SAT Commissioning and Site Integration Test Procedure for the EPM Electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied EPM

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

TESTING STRATEGY

The testing strategy includes the following two phases.

The Installation testing phase is developed to test the:

- Documentation;
- Mechanical installation;
- Electrical installation.
-

The Functioning testing phase is developed to test the functioning of the:

- Mechanical equipment's

Electrical equipment's

Safety precaution

Before the beginning of the test brief safety induction will be done to all the people attending the test.
We will describe the company safety rules and the rules to be followed while attending the test.

Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test): the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Elkadeem	ENPPI		17/7/2021
Mohamed Ibrahim	PPC		17/7/2021
Com Cotiu Fabo	CEAR		12-07-21
	CEAR		

Section 1: EPM DESIGN & FABRICATION

DESCRIPTION OF THE TESTS

Visual test
Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages on the welds.

Dimensional Check
Dimensional Check will be performed to check if the dimensions of the component are in tolerances as per manufacturing drawings.

Surface Painting & Coating Check
Surface Painting check will be performed to check the painting coating and final internal/external color.

Identification and Marking Check
Identification and Marking Check will be performed to verify the correct nameplate of the EPM Module

1.1 Documentation

Following a list of the relevant documents used to perform the SAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R,7	EPM General Arrangements
01251-100-S07-B04-0001	R.5	EPM Foundation Drawings
01251-100-S07-B05-0001	R.2	EPM Doors drawing and fire rating
01251-100-S07-B05-0002	R.1	EPM False floor and fire rating
01251-100-S07-B05-0003	R.1	EPM Roof Accessibility
01251-100-S07-B05-0005	R.1	EPM Sandwich Walls Panel-Internal Partition
01251-100-S07-D01-0001	R.3	EPM Detail Design Fabrication Drawings
01251-100-S07-P05-0001	R.4	Surface Preparation Painting & Coating Procedures
01251-100-S07-D04-0001	R.2	EPM Nameplate format drawing
01251-100-S07-D99-0003	R.2	Transformer Dragging System Layout
01251-100-S07-D99-0001	R.2	EPM Lifting Pad Eyes Layout
01251-100-S07-D99-0002	R.2	EPM Centre of gravity Location Layout

1.1	Documentation check				
	Aim	Check the presence of the project documentation.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the state of the documentation listed on chapter 1.2			
	Acceptance criteria	All the documentation listed on chapter 1.1 Section 1 of the FAT procedure have to be present.			
	Notes				
	Executed	☑ Yes ☐ No	**Result**	☑ Positive	☐ Negative
	Date	**Supplier**	**Customer**	**Client**	
	17-07-21	[signature]	[signature]	[signature]	

1.2 Visual Check

1.2	Visual Check				
	Aim	Visual check of the good construction of the EPM			
	Pre-requisites	N.A.			
	Test description	Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages on the welds.			
	Acceptance criteria	Visual test and relevant photo			
	Notes				
	Executed	☒ Yes ☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

Section 2: EPM ELECTRICAL INSTALLATION

DESCRIPTION OF THE TESTS

Visual test
General visual test will be performed to verify the good workmanship

Internal and External Lighting System
Visual test and functional test will be performed as per the relevant documentation

Electrical Safety Check Lighting System
Safety check insulation and dielectric test

Internal raceway and EPM wiring

Visual inspection of the raceway and internal EPM wiring

Identification and Marking Check

Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test): the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Nadeem	ENPPI	[signature]	17/7/2021
M. Ibrahim	PPC	[signature]	17/7/2021
Cotti Cottini Fabio	CEAR	[signature]	17-07-21
	CEAR		

2.1 Documentation.

Following a list of the relevant documents used to perform the SAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-E99-0008	R.3	Lighting and Small Power System Electrical Layout
01251-100-S07-E99-0011	R.4	Cable Routing Power & Lighting Layout
01251-100-S07-C99-0001	R.3	Lighting Lux Level Calculation
01251-100-S07-K09-0004	R.4	EPM Ancillaries Supplier Data Sheet

2.1	**Documentation check**			
	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 2.1.		
	Acceptance criteria	All the documentation listed on chapter 2.1 Section 2 of the SAT procedure have to be present.		
	Notes			
	Executed	☑ Yes ☐ No	**Result**	☑ Positive ☐ Negative
	Date	**Supplier**	**Customer**	**Client**
	17-07-21	[signature]	[signature]	[signature]

2.2 Internal and External Lighting system

2.2.1	**Internal and External Lighting Fixtures and Small Power system layout**			
	Aim	Verify the installation of the fixtures and the small power system of the EPM Module.		
	Pre-requisites	N.A.		
	Test description	The installation and the material must be in compliance with the values reported on the following documents: **01251-100-S07-E99-0008 Lighting and Small Power System Layout** **01251-100-S07-D99-0011 Cable routing Power & Lighting Layout** **01251-100-S07-K09-0004 Ancillaries supplier data sheet**		
	Acceptance Criteria	Visual check and quantity check of the equipment		
	Notes			
	Executed	☑ Yes ☐ No	**Result**	☑ Positive ☐ Negative
	Date	**Supplier**	**Customer**	**Client**
	17-07-11	[signature]	[signature]	[signature]

2.2.2	**Internal and External Lighting Fixtures Functional Test**			
	Aim	Verify the proper operation of the internal and external EPM lighting system.		
	Pre-requisites	Energize the indoor and outdoor distribution boards with 400 V 3P+N		
	Test description	The test must be in compliance with the following documents: **01251-100-S07-E99-0008 Lighting and Small Power System Layout** **01251-100-S07-K09-0004 Ancillaries supplier data sheet** **01251-100-S07-E10-0002 Indoor Panel Single Line diagram** **01251-100-S07-E10-0003 Outdoor Panel Single Line Diagram** **01251-100-S07-D99-0011 EPM Cable routing & Lighting Layout** **01251-100-S07-C99-0001 Lighting Lux level Calculation**		
	Acceptance Criteria	Single Test of the various lighting circuit as defined in the electrical documentation. Check the correct function of the emergency light fixtures external and internal Check the correct function of the twilight switch and the emergency line circuit		
	Notes			
	Executed	☑ Yes ☐ No	**Result**	☑ Positive ☐ Negative
	Date	**Supplier**	**Customer**	**Client**
	17-07-21	[signature]	[signature]	[signature]

<table>
<tr><td rowspan="9">2.2.3</td><td colspan="5">Small Power system
Functional test</td></tr>
<tr><td>Aim</td><td colspan="4">Verify the proper operation of the internal and external EPM receptacles</td></tr>
<tr><td>Pre-requisites</td><td colspan="4">Supply the indoor and outdoor distribution with 400 V 3P+N</td></tr>
<tr><td>Test description</td><td colspan="4">The test must be in compliance with the following documents:
01251-100-S07-E99-0008 Lighting and Small Power System Layout
01251-100-S07-K09-0004 Ancillaries supplier data sheet
01251-100-S07-E10-0002 Indoor Panel Single Line diagram
01251-100-S07-E10-0003 Outdoor Panel Single Line Diagram
01251-100-S07-D99-0011 EPM Cable routing & Lighting Layout</td></tr>
<tr><td>Acceptance Criteria</td><td colspan="4">Single Test of the small power system circuit as defined in the electrical documentation.
Check the correct function of the small power system external and internal</td></tr>
<tr><td>Notes</td><td colspan="4"></td></tr>
<tr><td>Executed</td><td>☑ Yes ☐ No</td><td>Result</td><td>☑ Positive</td><td>☐ Negative</td></tr>
<tr><td>Date</td><td>Supplier</td><td>Customer</td><td colspan="2">Client</td></tr>
<tr><td>17-07-21</td><td>[signature]</td><td>[signature]</td><td colspan="2">[signature]</td></tr>
</table>

Section 3: EPM LIGHTNING SYSTEM

DESCRIPTION OF THE TESTS

Visual test
General visual test will be performed to verify the good workmanship

Lightning System
Visual test and continuity check of the earthing system will be performed as per the relevant documentation

Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test) the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Kadem	ENPPI	[signature]	17/7/2021
M. Ibrahim	PPC	[signature]	17/7/2021
Cotti Cottini Fabio	CEAR	[signature]	17-07-21
	CEAR		

3.1 Documentation.

Following a list of the relevant documents used to perform the SAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	General Arrangement
01251-100-S07-E99-0010	R.4	Lightning System General Layout
01251-100-S07-C99-0008	R.3	Lightning Protection Calculation

<table>
<tr><td rowspan="9">3.1.1</td><td colspan="4">Documentation check</td></tr>
<tr><td>Aim</td><td colspan="3">Check the presence of the project documentation.</td></tr>
<tr><td>Pre-requisites</td><td colspan="3">N.A.</td></tr>
<tr><td>Test description</td><td colspan="3">Check the presence and the state of the documentation listed on chapter 3.1</td></tr>
<tr><td>Acceptance criteria</td><td colspan="3">All the documentation listed on chapter 3.1 Section 3 of the SAT procedure have to be present.</td></tr>
<tr><td>Notes</td><td colspan="3"></td></tr>
<tr><td>Executed</td><td>☑ Yes ☐ No</td><td>Result</td><td>☑ Positive ☐ Negative</td></tr>
<tr><td>Date</td><td>Supplier</td><td>Customer</td><td>Client</td></tr>
<tr><td>17-07-21</td><td>[signature]</td><td>[signature]</td><td>[signature]</td></tr>
</table>

3.2 Lightning System

3.2.1	Lightning system layout installation			
	Aim	Verify the installation of the EPM lightning system		
	Pre-requisites	N.A.		
	Test description	The installation and the material must be in compliance with the following document: **01251-100-S07-E99-0010 Lightning System Layout**		
	Acceptance Criteria	Visual check and quantity check of the equipment		
	Notes	* Lighting rods installation to be Completed		
	Executed	☒ Yes ☐ No	**Result**	☐ Positive ☐ Negative
	Date	**Supplier**	**Customer**	**Client**
	17-07-21	[signature]	[signature]	[signature]

3.2.2

Lightning system continuity check

Aim	Verify the continuity of the EPM lightning system
Pre-requisites	N.A.
Test description	The installation and the material must be incompliance with the following document: **01251-100-S07-E99-0010 Lightning System Layout**
Acceptance Criteria	The resistance measured shall be at least < Ω.
Instrument	Type: MEGGER Mod.: MIT 420-2 S/N : / Test Certificate : /
Notes	< 1 Ω
Executed	☑ Yes ☐ No
Result	☑ Positive ☐ Negative

Date	Supplier	Customer	Client
17-07-21	[signature]	[signature]	[signature]

Section 4: EPM MCT Multicable Transition System

DESCRIPTION OF THE TESTS

Visual test

General visual test will be performed to verify the good workmanship

Identification and Marking Check

Personnel involved in the SAT.

The table below shows the people who participate at the activity of the SAT ((Commissioning and Site Integration Test) the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed [illegible]	ENPPI	[signature]	17/7/2021
M. Ibrahim	PPC	[signature]	17/7/2021
COTTI COTTIN FABIO	CEAR	[signature]	17-07-21
	CEAR		

4.1 Documentation.

Following a list of the relevant documents used to perform the sAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	General Arrangement
01251-100-S07-E99-0005	R.4	MCT Frame Layout and schedule

4.1.1	Documentation check				
	Aim	Check the presence of the project documentation.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the state of the documentation listed on chapter 4.1.			
	Acceptance criteria	All the documentation listed on chapter 4.1 Section 4 of the SAT procedure have to be present.			
	Notes				
	Executed	☑ Yes ☐ No	**Result**	☑ Positive	☐ Negative
	Date	**Supplier**	**Customer**	**Client**	
	17-07-21	[signature]	[signature]	[signature]	

4.2 MCT FRAME

4.2	MCT Frame layout installation			
	Aim	Verify that the installation of the MCT layout		
	Pre-requisites	N.A.		
	Test description	The installation and the material must be in compliance with the following document: **01251-100-S07-E99-0005 MCT Frame Layout Arrangement**		
	Acceptance Criteria	Visual check and quantity check of the equipment		
	Notes	MCT SHALL BE INSTALLED AFTER CABLE COAMING COMPLETION (laying)		
	Executed	☑ Yes ☐ No	**Result**	☐ Positive ☐ Negative
	Date	**Supplier**	**Customer**	**Client**
	17-07-21			

Enppi	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	COSTRUZIONI ELETTROTECNICHE CEAR s.r.l.

CRUDE OIL TANK FARM
1251-100

EPM MODULE 030-EPM2

DRY TYPE TRANSFORMER

SAT

Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved

Notes:	EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.		
	Contract Number: 1251-100-500-16		
	Enppi Ref.: 01251-100-S07-P06-0003 R.1		
		Language: E	Total Pages:9

INDEX

INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the EPM Electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied EPM

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

Personnel involved in the SAT.

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test): the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Nadeem	ENPPI	[signature]	17/7/2021
M. Ibrahim	PPC	[signature]	17/7/2021
Cotti Cottini Fabio	CEAR	[signature]	17-07-21
	CEAR		

DESCRIPTION OF THE TESTS

Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages on the welds.

Dimensional Check will be performed to check if the dimensions of the component are in tolerances as per manufacturing drawings.

Surface Painting check will be performed to check the painting coating and final internal/external color.

Identification and Marking Check

Routine test certificate check

1. Documentation

Following a list of the relevant documents used to perform the SAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	EPM General Arrangements
01251-100-S07-E99-0007	R.4	Dry Type Transformer General Arrangement
01251-100-S07-K09-0005	R.3	EPM Transformer Data Sheet Supplier
01251-100-S07-K11-0005	R.4	EPM Filled in Purchaser Transformer Data Sheet
01251-100-S07-K11-0006	R.5	EPM Filled in Purchaser Bus Duct Data Sheet
01251-100-S07-E99-0006	R.4	LV Bus Duct General Arrangement
01251-100-S07-K12-0001	R.1	EPM Noise Data Sheet
01251-100-S07-E99-0009	R.4	Earthing system layout
01251-100-S07-E10-0001	R.5	LVSWG Single Line Diagram

1.1	Documentation check			
	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.		
	Acceptance criteria	All the documentation listed on chapter 1.1 Section 1 of the FAT procedure have to be present.		
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

2. Visual Check (without voltage supply)

2.2.1	Visual Check			
	Aim	Visual check of the good construction of the transformer and the transformer box		
	Pre-requisites	N.A.		
	Test description	Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages.		
	Acceptance criteria	Visual test and relevant photo		
	Notes	MV CABLE TERMINATION AND IS NOT CONNECTIONS		
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

3. H.V. Cable Connection box

3.1	HV Cable Connection box				
	Aim	Verify the connection between transformer and HV box			
	Pre-requisites	N.A.			
	Test description	Visual connection marking check and tightening bolt control			
	Acceptance criteria	The dimensions must be in compliance with the values reported on the following documents: **01251-100-S07-E99-000 7 Dry Type transformer General Arrangements**			
	Marking phase check				
	Notes	**IMPORTANT NOTE** All operations concerning the H.V and MCT cable installation, cable connection ,6,6 kV power supply control, cable insulation and relevant tests are in charge of Enppi electrical commissioning department. Before supply the transformer with 6,6 kV all test must be done and certified with a test report.			
	Executed	☑ Yes ☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

4. Earthing Connection Check (without voltage supply)

4.1	Earthing Connection continuity check			
	Aim	Verify the installation of the earthing connection		
	Pre-requisites	N.A.		
	Test description	The installation and the material must be in compliance with the values reported on the following documents: **01251-100-S07-E99-0009 Earthing System Layout** **01251-100-S07-K009-0005 EPM Transformer Data Sheet Supplier**		
	Acceptance Criteria	The resistance measured shall be at least < Ω.		
	Instrument	Type: M05G+15 Mod.: H.I.T.G20-2 S/N: / Test Certificate: /		
	Notes	Resistance value: < 1 Ω		
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

5. H.V. Transformer energization 6,6 kV from Enppi substation (power on)

The activity is in charge of Enppi commissioning department

<table>
<tr><td rowspan="8">5.1</td><td colspan="5">Power on transformer 6,6 kV</td></tr>
<tr><td>Aim</td><td colspan="4">Energize the EPM transformer from the substation Enppi</td></tr>
<tr><td>Pre-requisites</td><td colspan="4">All operations and safety rules must be in charge of Enppi</td></tr>
<tr><td>Test description</td><td colspan="4">Energizing operation from the substation</td></tr>
<tr><td>Acceptance Criteria</td><td colspan="4">Verify the voltage value in accordance with the
01251-100-S07-K009-0005 EPM Transformer t Data Sheet Supplier</td></tr>
<tr><td>Instrument</td><td colspan="4">Verify and check the voltage value in the substation room</td></tr>
<tr><td>Notes</td><td colspan="4">IMPORTANT NOTE
All operations concerning the H.V and MCT cable installation, cable connection ,6,6 kV power supply control, cable insulation and relevant tests are in charge of Enppi electrical commissioning department.
Before supply the transformer with 6,6 kV all test must be done and certified with a test report.
Report test check
Power supply ....kV 17-07-21
L1-L2: ....kV
L2-L3: ....kV 6.6KV IS NOT
L3-L1: ....kV AVAILABLE.
Insulation resistance test H.V cable
Resistance value: .... Ω AFTER POWER UP
Dielectric test H.V. cable PERFORMED TEST</td></tr>
<tr><td>Executed</td><td>☑ Yes ☐ No</td><td>Result</td><td>☐ Positive</td><td>☐ Negative</td></tr>
<tr><td></td><td>Date</td><td>Supplier</td><td colspan="2">Customer</td><td>Client</td></tr>
<tr><td></td><td>17-07-21</td><td>[signature]</td><td colspan="2">[signature]</td><td>[signature]</td></tr>
</table>

Enppi	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	COSTRUZIONI ELETTROTECNICHE CEAR s.r.l.

CRUDE OIL TANK FARM
1251-100

EPM MODULE 030-EPM2

BUS DUCT

SAT
Commissioning and Site Integration Test Procedures

1	17/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved

Notes:	EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.	
	Contract Number: 1251-100-510-16	
	Enppi Ref.: 01251-100-S07-P06-0004 R.1	
	Language: E	Total Pages:9

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INTRODUCTION BUS DUCT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the EPM Electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied EPM

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

Personnel involved in the SAT.

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test): the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Wadeen	ENPPI	[signature]	17/7/2021
M. Ibrahim	PPC	[signature]	17/7/2021
Comi Comin Fabio	CEAR	[signature]	17-07-21
	CEAR		

DESCRIPTION OF THE TESTS

Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages on the welds.

Dimensional Check will be performed to check if the dimensions of the component are in tolerances as per manufacturing drawings.

Surface Painting check will be performed to check the painting coating and final internal/external color.

Identification and Marking Check will

Safety check insulation and dielectric test

1 Documentation.

Following a list of the relevant documents used to perform the FAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	EPM General Arrangements
01251-100-S07-E99-0006	R.4	LV Bus Duct General Arrangement
01251-100-S07-K09-0006	R.2	EPM Bus Duct Data Sheet Supplier
01251-100-S07-K11-0006	R.5	EPM Filled in Purchaser Bus Duct Data Sheet
01251-100-S07-E99-0007	R.4	Dry Type Transformer General Arrangement

1.1.1	Documentation check			
	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.		
	Acceptance criteria	All the documentation listed on chapter 1.1 Section 1 of the FAT procedure have to be present.		
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

2. Visual Check

<table>
<tr><td rowspan="9">2.1</td><td colspan="4">Visual Check</td></tr>
<tr><td>Aim</td><td colspan="3">Visual check of the good construction of the Bus Duct</td></tr>
<tr><td>Pre-requisites</td><td colspan="3">N.A.</td></tr>
<tr><td>Test description</td><td colspan="3">Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages.</td></tr>
<tr><td>Acceptance criteria</td><td colspan="3">Visual test and relevant photo</td></tr>
<tr><td>Notes</td><td colspan="3"></td></tr>
<tr><td>Executed</td><td>☑ Yes ☐ No</td><td>Result</td><td>☑ Positive ☐ Negative</td></tr>
<tr><td>Date</td><td>Supplier</td><td>Customer</td><td>Client</td></tr>
<tr><td>17-07-21</td><td>[signature]</td><td>[signature]</td><td>[signature]</td></tr>
</table>

3. Electrical Safety Check

3.1.1	**Electrical Safety Check** **Insulation resistance measuring**			
	Aim	Measure the insulation resistance between each phase and neutral against earth (with the remaining phases and neutral connected to the earth).		
	Pre-requisites	N.A.		
	Test description	The insulation resistance tests shall be carried out with all manually operated and latched type switching devices in the closed position and main fuses installed.		
	Acceptance criteria	The insulation resistance measured shall be at least 10 MΩ.		
	Instrument	Type: MEGOHM Mod. MIT 420-2 S/N : / Test Certificate : /		
	Test results	Value checked L1-E: 25.6 Ω L2-E: 26.26 Ω L3-E: 20.6 Ω N-E : 26.06 Ω		
	Notes			
	Executed	☑ Yes ☐ No	**Result**	☑ Positive ☐ Negative
	Date	**Supplier**	**Customer**	**Client**
	17-07-21	[signature]	[signature]	[signature]

3.1.2	Electrical Safety Check Dielectric test for bus bars			
	Aim	Perform a dielectric test of the main circuits (400V ac) in accordance with CEI EN 61439-1 standard.		
	Pre-requisites	N.A.		
	Test description	Withstand voltage should be 2500 V ac for 1 minute. Dielectric tests shall be done on 10% of the number of similar units with a minimum of 2 units.		
	Acceptance criteria	Please refer to chapter 10.9.2.4 of the CEI EN 61439-1 Standard.		
	Instrument	Type: MOTAMT Mod.: MI2170 S/N: SM005 Test Certificate: 3004-01		
	Test results	L1 - G = 1,1 MΩ L2 - G = 1,1 MΩ L3 - G = 1,1 MΩ N - G = 1,1 MΩ		
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

3.1.3

Earthing Bus Duct continuity check				
Aim	Verify t the installation of the earthing system of the Bus Duct			
Pre-requisites	N.A.			
Test description	The installation and the material must be in compliance with the values reported on the following documents: **01251-100-S07-E99-0009 Earthing System Layout** **01251-100-S07-K009-0006 EPM Bus Duct Data Sheet Supplier** **01251-100-S07-K011-0006 EPM Filled in Purchaser Bus Duct Data Sheet**			
Acceptance Criteria	The resistance measured shall be at least < Ω.			
Instrument	Type: MI 6645 Mod.: MIT420-2 S/N : / Test Certificate : /			
Notes	Value checked: < 1 Ω			
Executed	☑ Yes ☐ No	**Result**	☑ Positive	☐ Negative
Date	**Supplier**	**Customer**	**Client**	
17-07-21	[signature]	[signature]	[signature]	

Enppi	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	CEAR COSTRUZIONI ELETTROTECNICHE CEAR s.r.l.

CRUDE OIL TANK FARM
1251-100

EPM MODULE 030-EPM2

LVSWG MCC

SAT

Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
0	20/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved

Notes:	EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.		
	Contract Number: 1251-100-16-7		
	Enppi Ref.: 01251-100-S07-P06-0002 R.1		
		Language: E	Total Pages:30

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INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the SAT Commissioning and Site Integration Test Procedure for the EPM Electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied EPM

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

TESTING STRATEGY

The testing strategy includes the following two phases.

The Installation testing phase is developed to test the:

- Documentation;
- Mechanical installation;
- Electrical installation.

The Functioning testing phase is developed to test the functioning of the:

- Mechanical equipment's
- Electrical equipment's

Safety precaution

Before the beginning of the test brief safety induction will be done to all the people attending the test.

We will describe the company safety rules and the rules to be followed while attending the test.

Personnel involved in the SAT.

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test Procedures): the present people must sign next to their name.

CEAR can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Nadeem	ENPPI	[signature]	17/7/2021
M. Ibrahim	PPC	[signature]	17/7/2021
Cotti Cottin Fabio	CEAR	[signature]	17-07-21
	CEAR		

DESCRIPTION OF THE TESTS

Visual test

General visual test will be performed to verify the good workmanship and correct installations

This document is the Site Acceptance Test for the Motor Control Center.

The document is the acceptance protocol concerning the hardware characteristics of the supplied MCC.

1.1. Testing Equipment to be used

Following a list of the instruments shall be available during the SAT by ENPPI:

Instrument	Model	Serial Number	Calibration expiry date
Electrical safety Tester for insulation and Dielectric tests	METREL MI2170	SM005	06-10-23
High voltage insulation Tester up to 1 kV DC (megger)	MEGGHER HT 4102	/	/
Torque wrench	USA 6	A30720290/675	06-08-22
Multimeter	HT ITALIA HT1100	18600599	01-01-22
Ammeter Clamp	HT ITALIA HT9020	19073004	01-01-24

1.2. Documentation.

Following a list of the relevant documents used to perform the SAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	General Arrangement
01251-100-S07-E02-0001	R.4	LVSWG Overall Dimensions Panel Layout
01251-100-S07-E10-0001	R.5	LVSWG Single line diagram.
01251-100-S07-E99-0006	R.4	LV Bus Duct General Arrangement
01251-100-S07-K09-0003	R.4	EPM Main Equipment Supplier Data Sheet
01251-100-S07-E05-0002	R.5	EPM Internal Cable schedule

1.2.1. Documentation check

<table>
<tr><td rowspan="8">1.2.1</td><td colspan="5">Documentation check</td></tr>
<tr><td>Aim</td><td colspan="4">Check the presence of the project documentation.</td></tr>
<tr><td>Pre-requisites</td><td colspan="4">N.A.</td></tr>
<tr><td>Test description</td><td colspan="4">Check the presence and the state of the documentation listed on chapter 4.1 of the SAT procedure.</td></tr>
<tr><td>Acceptance criteria</td><td colspan="4">All the documentation listed on chapter 1.1 of the SAT procedure have to be present.</td></tr>
<tr><td>Notes</td><td colspan="4"></td></tr>
<tr><td>Executed</td><td>☑ Yes ☐ No</td><td>Result</td><td colspan="2">☑ Positive ☐ Negative</td></tr>
<tr><td>Date</td><td>Supplier</td><td>Customer</td><td colspan="2">Client</td></tr>
<tr><td></td><td>17-07-21</td><td>[signature]</td><td>[signature]</td><td colspan="2">[signature]</td></tr>
</table>

2. GENERAL CONSTRUCTION CHECK

2.1.1	Terminal block connections.			
	Aim	Check the terminal block connections (wiring and tightening).		
	Pre-requisites	N.A.		
	Test description	Spot visual inspection and tightening test (with a screw driver).		
	Acceptance criteria	The terminal block connections must be in compliance with the following documents: **01251-100-S07-E10-0001 LVSWG Single Line Diagram**		
	Instrument	Screw driver.		
	Notes			
	Executed	☒ Yes ☐ No	**Result**	☒ Positive ☐ Negative
	Date	**Supplier**	**Customer**	**Client**
	17-07-21	[signature]	[signature]	[signature]

2.1.2	LVSWG Cleanliness of the equipment			
	Aim	Check the cleanliness of the equipment.		
	Pre-requisites	Switchgear ready to be energized.		
	Test description	Visual inspection.		
	Acceptance criteria	The LV PMCC Switchgear is clean, dust has been removed and no tools are present in it.		
	Instrument	N.A.		
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

2.1.3	Mechanical and electrical interlocks				
	Aim	Check the functioning of the mechanical and electrical interlocks, door handle interlocks, key interlocks)			
	Pre-requisites	N.A.			
	Test description	Functional test of all the mechanical and electrical interlocks.			
	Acceptance criteria	All the mechanical and electrical interlocks described on the following documents must be operative: The LVSWG arrangement must be in compliance with the following documents: **01251-100-S07-E02-0001 LVSWG Overall Dimension Panel Layout.** **01251-100-S07-E10-0001 LVSWG Single line Diagram**			
	Instrument	Operating handles, keys.			
	Notes				
	Executed	☑ Yes ☐ No	**Result**	☑ Positive	☐ Negative
	Date	**Supplier**	**Customer**	**Client**	
	17-07-21	[signature]	[signature]	[signature]	

3. EQUIPMENT CHECK

<table>
<tr><td rowspan="9">3.1</td><td colspan="5">Visual check of power and auxiliary equipment like circuit breakers, switches, relays, contactors, lamps (model / rating).</td></tr>
<tr><td>Aim</td><td colspan="4">Check the correct selection, installation and wiring of the circuit breakers and switches.</td></tr>
<tr><td>Pre-requisites</td><td colspan="4">N.A.</td></tr>
<tr><td>Test description</td><td colspan="4">Visual inspection of electrical components.</td></tr>
<tr><td>Acceptance criteria</td><td colspan="4">The LVSWG circuit breakers and switches must be in compliance with the following document:
01251-100-S07-E10-0001 LVSWG Single line Diagram</td></tr>
<tr><td>Instrument</td><td colspan="4">N.A.</td></tr>
<tr><td>Notes</td><td colspan="4">* The 230Vac/110VDC power supply is missing the 12V module that shall be provided by Cear</td></tr>
<tr><td>Executed</td><td>☑ Yes ☐ No</td><td>Result</td><td colspan="2">☑ Positive ☐ Negative</td></tr>
<tr><td>Date
17-07-21</td><td>Supplier
[signature]</td><td colspan="2">Customer
[signature]</td><td>Client
[signature]</td></tr>
</table>

4. ELECTRICAL SAFETY CHECK

4.1.1	Insulation resistance test main circuits			
	Aim	A measurement of the resistance of the main circuit shall be made in accordance to IEC 61439-1 Standard.		
	Pre-requisites	N.A.		
	Test description	The measurement shall be made with DC voltage MegaOhmeter by measuring the resistance across the terminals of each phase.		
	Acceptance criteria	Resistance value bigger than 10 Mohm. The measured value of the resistance shall be listed in the test report, as well as the general conditions during the test (current, air temperature, etc.) for future comparison.		
	Instrument	Type: MEGGHΩ Mod.: MIT420-2 S/N: / Test Certificate: /		
	Test results	L1-E = 2,41 GΩ L2-E = 2,07 GΩ L3-E = 2,30 GΩ N-E = 5,0 GΩ		
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

4.1.2 Dielectric test for main circuits.

Aim	Perform a dielectric test of the main circuits in accordance to IEC 61439-1 Standard.
Pre-requisites	N.A.
Test description	Withstand voltage should be 2,5 kV ac for 5 seconds. The power-frequency voltage test shall be performed according to the IEC requirements. The test voltage shall be applied connecting each phase conductor of the main circuit in turn to the high-voltage terminal of the test supply, Dielectric tests shall be done on 10% of the number of similar units with a minimum of 2 units.
Acceptance criteria	Please refer to chapter 10.9.2.4 of the CEI EN 61439-1 Standard.
Instrument	Type: MSTNOL Mod.: MFL170 S/N : SM005 Test Certificate: 3004-01
Test results	L1-G = 2,5 MΩ L2-G = 2,5 MΩ L3-G = 2,3 MΩ N-G = 2,8 MΩ
Notes	

Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative

Date	Supplier	Customer	Client
17-07-2?	[signature]	[signature]	[signature]

4.1.3	Dielectric test for auxiliary circuits.			
	Aim	Perform a dielectric test of the auxiliary circuits in accordance with CEI EN 61439-1 standard.		
	Pre-requisites	N.A.		
	Test description	Withstand voltage should be 1500 V ac for 5 seconds. Dielectric tests shall be done on 10% of the number of similar units with a minimum of 2 units.		
	Acceptance criteria	Please refer to chapter 10.9.2.4 of the CEI EN 61439-1 Standard.		
	Instrument	Type: Metrel Mod.: MI 2170 S/N : SM005 Test Certificate: 3004-01		
	Test results	Feeder AUX SUPPLY C = 0,7 mA W = 0,7 mA DOC AUX SUPPLY C = 0,2 mA W = 0,2 mA REF 615 AUX SUPPLY C = 0,1 mA W = 0,1 mA AUX SUPPLY 230V C = 12 mA W = 15 mA AUX SUPPLY 110Vdc + = 0,1 mA − = 0,1 mA		
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-24	[signature]	[signature]	[signature]

5. POWER SUPPLY CHECK

5.1.1	Main circuits Power supply			
	Aim	Check the main circuits power supply.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the value of the main power supply voltage.		
	Acceptance criteria	The main circuits power supply voltage should be 400V 3P+N 50Hz.		
	Instrument	Type: HT ITALIA Mod.: HT1100 S/N : 98600599 Test Certificate: 7544		
	Measured voltage	Value: 400V	Frequency	50HZ
	Notes	//		
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

5.1.2	Auxiliary circuits Power supply			
	Aim	Check the auxiliary circuits power supply.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the value of the auxiliary power supply voltage.		
	Acceptance criteria	The auxiliary circuits power supply voltage should be 230V 1P+N 50Hz.		
	Instrument	Type: HT ITAU9 Mod.: HT3100 S/N: 98600599 Test Certificate: 7544		
	Measured voltage	**Value** 230V	**Frequency** 50 HZ	
	Notes	//		
	Executed	☑ Yes ☐ No	**Result**	☑ Positive ☐ Negative
	Date	**Supplier**	**Customer**	**Client**
	17-07-21	[signature]	[signature]	[signature]

5.1.3	Heaters and Internal light			
	Aim	Check the heaters power supply.		
	Pre-requisites	Low voltage auxiliary power supply 230 Vac control circuits interconnected.		
	Test description	N.A.		
	Acceptance criteria	The heaters power supply voltage should be 230V 1P+N 50Hz.		
	Instrument	Type: HT ITJU17 Mod.: HT 8100 S/N: 98600599 Test Certificate: 7544		
	Measured voltage	Value: 230 V	Frequency: 50Hz	
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

6. FUNCTIONAL TESTING.

6.1. Electrical equipment.

6.1.1	LVSWG power sections operating conditions.				
	Aim	Operation tests shall be made to ensure that the switching devices and removable parts and mechanical interlocks work properly.			
	Pre-requisites	N.A.			
	Test description	These tests shall be performed without voltage on or current in the main circuits.			
	Acceptance criteria	It shall be verified that: – the switching devices open and close correctly – each removable part can be inserted and removed correctly; – all interlocks work properly.			
	Instrument				
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative	
	Date	Supplier	Customer	Client	
	17-07-2	[signature]	[signature]	[signature]	

6.1.2	LVSWG withdrawable units operating conditions.				
	Aim	Check the functioning of the LVSWG withdrawable motor starters			
	Pre-requisites	N.A.			
	Test description	Check the mechanical and electrical functioning of the withdrawable units: • TEST mode; • REMOTE mode;			
	Acceptance criteria	The mechanical and electrical functioning of the withdrawable units must be in compliance with the following document: **01251-100-S07-E10-0001 LVSWG Single line Diagram**			
	Checked units				
	Notes				
	Executed	☑ Yes ☐ No	**Result**	☑ Positive	☐ Negative
	Date	**Supplier**	**Customer**	**Client**	
	17-07-21	[signature]	[signature]	[signature]	

6.1.3	LVSWG withdrawable units operating conditions.			
	Aim	Check the functioning of the LVSWG withdrawable feeders		
	Pre-requisites	N.A.		
	Test description	Check the mechanical and electrical functioning of the withdrawable units:		
	Acceptance criteria	The mechanical and electrical functioning of the withdrawable units must be in compliance with the following document: **01251-100-S07-E10-0001 LVSWG Single line Diagram**		
	Checked units			
	Notes			
	Executed	☑ Yes ☐ No	**Result**	☑ Positive ☐ Negative
	Date	**Supplier**	**Customer**	**Client**
	17-07-21	[signature]	[signature]	[signature]

6.1.4 Protection relays functional test.

Aim	Check and test the protective relays by current injection on primary and secondary circuits.
Pre-requisites	N.A.
Test description	Inject the test current into the primary and secondary circuits of the Current Transformers and check the intervention of the relevant protection relays. Protection relays to be checked are the ones of the: • LVSWWG Incoming sections; • LVSWG withdrawable units.
Acceptance criteria	The protection relays intervention must be in compliance with the following document: **01251-100-S07-E10-0001 LVSWG Single line Diagram**
Protection functions Tested	FAT REPORT
Notes	
Executed	☑ Yes ☐ No — **Result** ☑ Positive ☐ Negative

Date	Supplier	Customer	Client
17-07-21	[signature]	[signature]	[signature]

6.1.5	Inter-changeability of electrically identical components.			
	Aim	Check the inter-changeability of electrically identical components.		
	Pre-requisites	N.A.		
	Test description	Change the position/assembling of electrically identical components.		
	Acceptance criteria	The system LVSWG must continue to work properly.		
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

7. COMMISSIONING and START-UP PROCEDURES

7.1. Preliminary operations.

Before starting-up the electrical and instrumentation commissioning of the M.C.C. all the erection activity have to be completed and all the followings point should be checked and confirmed.

7.1.1 Mechanical assembling check list.

	Check equipment' alignment	☐
	Check all bolts fixing	☐

7.1.2 Electrical connection check list.

	Check cabling connection	☐
	Check the insulation resistance of the outgoing cabling before energising the loads	☐

7.1.3 Checks without power supply.

Before energising the system, all the followings point should be checked and confirmed.

	Check the grounding connection of the MCC	☐
	Check and set all the electrical protection as per the wiring diagram	☐

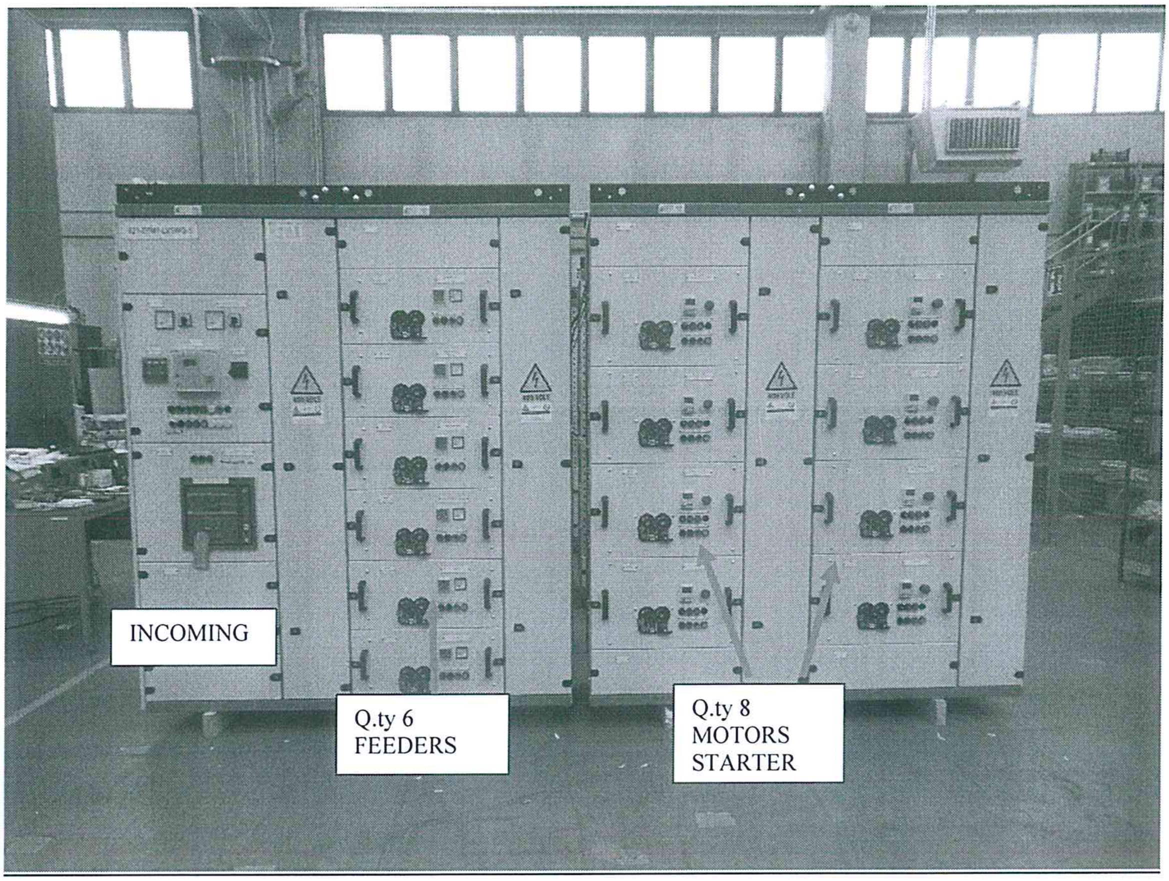
7.2. COMMISSIONING

Before starting the MCC energising sequence, all the Incoming Line Circuit breaker, the drawers main circuit breakers and the miniature circuit breakers must be previously opened.

MCC Power section commissioning/operating.

The MCC is supplied by one incoming line from transformer Tag 0XY-EPM(Z)-TR-1 400V 3ph +P + N (see fig. 1.1).

Fig. 1.1 – MCC Incoming Lines



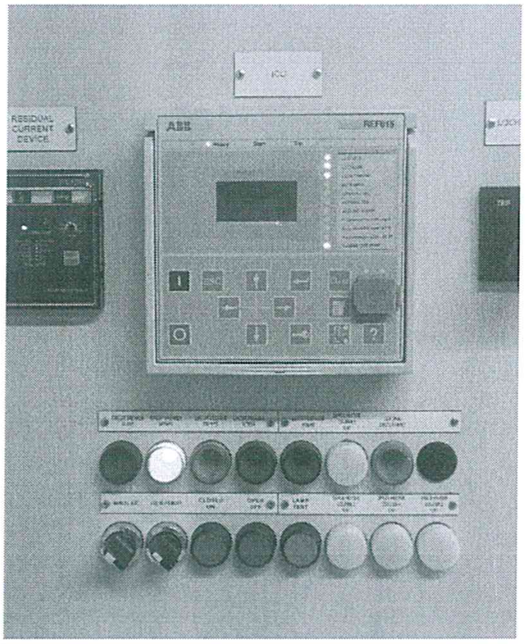
To start with the commissioning operation the LVSWG MMC shall be fed from the transformer 400 V 50 Hz 3P +N for power circuits and fed from the UPD panel for the auxiliary circuits 230V 50 Hz 1P+N.

7.3. INCOMING LINE SWITCH FUNCTION (column 1)

7.3.1. NORMAL OPERATION

MAIN INCOMING SWTCH ON- OFF COMMAND

The main switch can be commanded in the following mode by the selector switch and operators installed on the auxiliary command panel of the incoming column of the MCC. (see picture below)



Selector switch 30SA1 “Manual-Automatic” function
-Manual position defines the switch command by Local command from the MCC
-Automatic position defines the switch command by the control relay REF 615.
Selector switch 30SA2 “Local-Remote” function
-Local position defines the command switch by the start/stop pushbutton installed on the command panel
-Remote position defines the command switch by the command from DCS Enppi

Local Operation sequences:

-Turn the selector switch 30SA1 in Manual position
-Turn the selector switch 30SA2 in Local position
-Press the pushbutton 30SB1 for “Close” command
-Press the pushbutton 30SB2 for “Open” command

Remote Operation sequences:
-Turn the selector switch 30SA1 in Automatic position
-Turn the selector switch 30SA2 in Remote position
-The command "Closed" from DCS command the closing of switch
-The command "Open" from DCS command the opening switch

Automatic Operation sequences:

-Turn the selector switch 30SA1 in Automatic position
-The "Close" command is generated from the relay REF 615
-The "Open" command is generated from the relay REF 615

7.3.2. POWER SUPPLY LOSS

The main incoming switch shall open due to under voltage protection (F27) controlled by protection relay REF615 (27A1)
The main switch of the feeder drawer shall remain closed
The main switch of the DOL drawer shall remain closed, motor contactor contactors shall open if under voltage continue more than 4.5 seconds.

7.3.3. POWER RESTORATION

The main incoming switch shall be closed in one of the way indicated in the point 1 Local, Remote or Automatic

If the motor contactor open, due to power loss for more than 4.5 seconds,) can be restarted manually from the local control station (Local Start/Stop) or from the DCS command (Start/Stop contact).
See point 8.3 DOL drawer

7.4. LVSWG MCC Columns

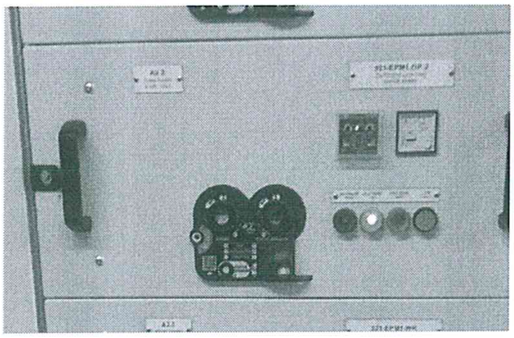
7.4.1. Drawer feeder commissioning/operating (column 2)

The drawer feeder column 2 is equipped with:

- Q.ty 5 Type F 4 poles drawers for feeder 100A
- Q.ty 1 Type F 3 poles drawers for feeder 63A

Front Drawer feeder type F (3 & 4 poles) see below picture

- **PA80A** Ammeter;
- **84SB1**, Lamp Test blue push-button
- **84HL1**, Green signal lamps (Circuit breaker open)
- **84HL2**, Red signal lamps (Circuit breaker closed)
- **84HL3**, Yellow signal lamps (Circuit breaker tripped on fault)
- **82A1**, Residual current monitor



The feeders are connected according to the doc. 01251-100-S07-E10-0001

Test sequence

Step	Check
Check that the MCC in energized	☑
Insert the drawer	☑

Step	Check
✓Check the correct function of the signal lamps by pushing the: ✓**84SB1** Lamp test push button ✓**84HL1**, Green signal lamps (Circuit breaker open) ✓**84HL2**, Red signal lamps (Circuit breaker closed) ✓**84HL3**, Yellow signal lamps (Circuit breaker tripped)	☑ ☑ ☑ ☑
✓**82A1**, Residual current monitoring check	☑

Service sequence

Insert the key; press and rotate 180° clockwise to "I" position to insert the incoming power connector switch	☒
Remove the key from the left side rotary handle	☒
Insert the key in the right side rotary handle, press and rotate 90° clockwise to "I" position; the main incoming circuit breaker is closed and the feeder is now operating	☒

See attachment Lafer ME_CUB ITA ENG manual drawer operation

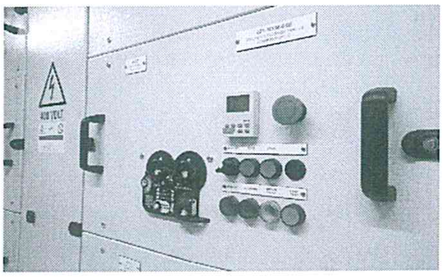
7.4.2. DOL drawer commissioning/operating (column 3 and 4)

The DOL drawer column 3 and 4 is equipped with

- Q.ty 4 Type M 3 poles drawers DOL motor starter > 7,5 kW and <75kW

<u>Front DOL Drawer type M</u> (3 poles) Motor starter > 7,5 Kw and <75kW see below picture

- **53SA1,** TEST-OFF-REMOTE black selector switch with 3 maintained position.
- **53SB2**, STOP red push-button
- **53SB3**, START green push-button
- **55SB1**, Lamp Test blue push-button
- **55HL1**, Red signal lamps (RUN - MOTOR ON)
- **55HL2**, Green signal lamps (STOP- MOTOR OFF)
- **55HL3**, Yellow signal lamps (MOTOR FAULT)
- **53SB1,** Mushroom Emergency stop push button



Motor starter drawer are connecting in according the doc. 01251-100-S07-E10-0001

DOL motor starter is equipped with:

- **QF50.1**, LV moulded case circuit breaker
- **UMC100.3 UC** controller with UMC panel LCD DISPLAY

Test sequence

Check that the MCC in energized	☒
Insert the drawer	☒

✓Check the correct function of the signal lamps by pushing the: ✓**55SB1** Lamp test push button ✓**55HL1**, Green signal lamps (Circuit breaker open) ✓**55HL2**, Red signal lamps (Circuit breaker closed) ✓**55HL3**, Yellow signal lamps (Circuit breaker tripped)	☒ ☒ ☒ ☒

Turn in "**TEST**" position the selector switch **53SA1** to TEST the control circuit UMC100.3 (contactor closed →**no power on the outgoing clamps**) ✓Check the status of the UMC100.3 ✓**55HL2**, green lamp "ON" means contactor open (Motor off) ✓**55HL1**, red lamp "ON" means contactor closed (Motor on) ✓**55HL3**, yellow lamp of reset pushbutton "ON" means main circuit breaker TRIP or UMC100.3 fault	☒ ☒ ☒ ☒

By the push button installed on the front of the drawer is possible to command the motor contactor: ✓**53SB1** Mushroom Stop pushbutton (emergency Stop) ✓**53SB3** Start command ✓**55HL1**, red lamp "ON" means contactor closed (Motor on) ✓**53SB2** Stop command ✓**55HL2**, green lamp "ON" means contactor open (Motor off) ✓**55HL3**, yellow lamp of reset pushbutton "ON" means main circuit breaker TRIP or UMC100.3 fault	☒ ☒ ☒ ☒ ☒ ☒

Remote sequence

Step	Check
Push the little grey button sited on the left side of the drawer (as indicated by the relevant label "STARTING OPERETION) in order to let you insert the operating key into the incoming power connector switch rotary handle	☐
Insert the key; press and rotate 180° clockwise to "I" position to insert the incoming power connector switch	☐
Remove the key from the left side rotary handle	☐
Insert the key in the right side rotary handle, press and rotate 90° clockwise to "I" position; the main incoming circuit breaker is closed and the unit is now operating	☐
Turn in "**REMOTE**" position the selector switch **53SA1** to let command remotely the motor starter. The **"REMOTE"** position allows the command of the motor from a local pushbutton installed at site near the motor. The local pushbutton is equipped with: ✓ **54SA1**, 3 Position selector switch **"HAND-0-AUTO"** ✓ **54SB2**, Start pushbutton ✓ **54SB1**, Stop pushbutton **"Hand"** position With the selector switch in **"HAND"** position the operator can start and stop the motor by a relevant Start and Stop pushbuttons installed on the local pushbutton. The start command is under the authorization from the DCS by digital contact "Permission" The stop command from DCS and the ESD stop are always in operation. Turning the selector switch 54SA1 on the local pushbutton in "0" position the motor stop The mushroom Stop pushbutton on the drawer (emergency Stop) is always in operation **"Auto"** position command by DCS (star/stop digital contact) With the selector switch in **"AUTO"** position the start and stop command of the motor is controlled from DCS by a digital contact The stop command from DCS and the ESD stop are always in operation. The stop pushbutton is always in operation. Turning the selector switch 54SA1 on the local pushbutton in "0" position the motor stop The mushroom Stop pushbutton on the drawer (emergency Stop) is always in operation	☐ (Hand) ☐ (Auto)

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CRUDE OIL TANK FARM
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EPM MODULE 030-EPM2

DP-1 Indoor Distribution Panel

SAT

Commissioning and Site Integration Test Procedures

Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved
1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		

Notes:	EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.
	Contract Number: 1251-100-16-7
	Enppi Ref.: 01251-100-S07-P06-0007 R.1
	Language: E · Total Pages. 11

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INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the Indoor DP-1 Distribution Panel of the EPM electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied DP-1 Panel

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

1.1 Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and SAT Integration Test) the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Abdeem	ENPPI	[signature]	17/7/2021
M. Ibrahim	PPC	[signature]	17/7/2021
Comi Comi Fabio	CEAR	[signature]	17-07-21
	CEAR		

1.2 DOCUMENTATION

Following a list of the relevant documents used to perform the FAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	General Arrangement
01251-100-S07-E02-0002	R.4	Indoor Light Distribution Panel Overall Dimensions Panel Layout
01251-100-S07-E10-0002	R.4	Indoor Panel Single & Wiring diagram.
01251-100-S07-K11-0007	R.4	EPM Filled in DP-1 Indoor Distribution Panel Data Sheet
01251-100-S07-E05-0002	R.5	EPM Internal Cable schedule

2. TESTING STRATEGY

The testing strategy includes the following two phases.

The **Installation** testing phase is developed to test the:

- Documentation;
- Mechanical installation;
- Electrical installation.

The **Functioning** testing phase is developed to test the functioning of the:

- Electrical equipment;

3. INSTALLATION TESTING

3.1 Documentation check.

3.1	Documentation check.				
	Aim	Check the presence of the project documentation.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.			
	Acceptance criteria	All the documentation listed on chapter 1.2 of the FAT procedure have to be present.			
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

3.2 INSTALLATION CHECK

3.2.1	**DP-1 Indoor Distribution Panel**				
	Aim	Check the DP-1 identification label.			
	Pre-requisites	N.A.			
	Test description	Visual inspection.			
	Acceptance criteria	The DP-1 identification label must be in compliance with the following documents: **01251-100-S07-E10-0002 Indoor Panel Single Line Diagram** **01251-100-S07-E02-0002 Indoor Overall Dimension Panel Layout**			
	Instrument	N.A.			
	Notes				
	Executed	☑ Yes ☐ No	**Result**	☑ Positive	☐ Negative
	Date	**Supplier**	**Customer**	**Client**	
	17-07-21	[signature]	[signature]	[signature]	

3.2.2	**DP-1 Indoor Distribution Panel Front lay-out**				
	Aim	Check the front DP-1 layout.			
	Pre-requisites	N.A.			
	Test description	Visual inspection.			
	Acceptance criteria	The front layout must be in compliance with the following documents: **01251-100-S07-E10-0002 Indoor Panel Single Line Diagram** **01251-100-S07-E02-0002 Indoor Overall Dimension Panel Layout.**			
	Instrument	N.A.			
	Notes				
	Executed	☑ Yes ☐ No	**Result**	☑ Positive	☐ Negative
	Date	**Supplier**	**Customer**	**Client**	
	17-07-21	[signature]	[signature]	[signature]	

3.2.3 Mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc.

Aim	Check the functioning of the mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc..
Pre-requisites	N.A.
Test description	Functional test of all the mechanical and electrical interlocks.
Acceptance criteria	All the mechanical and electrical interlocks described on the following documents must be operative: The DP-1arrangement must be in compliance with the following documents: **01251-100-S07-E10-0004 UPS Single Line Diagram** **01251-100-S07-E02-0002 Indoor Overall Dimension Panel Layout**
Instrument	N.A.
Notes	

Executed	☑ Yes ☐ No	**Result**	☑ Positive ☐ Negative
Date	**Supplier**	**Customer**	**Client**
17-07-21	[signature]	[signature]	

3.3 POWER SUPPLY CHECK

3.3.1	Main circuits Power supply				
	Aim	Check the main circuits power supply.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the value of the main power supply voltage.			
	Acceptance criteria	The main circuits power supply voltage should be 400V 3P+N 50Hz.			
	Instrument	Type: HT ITALIA Mod.: HT 2100 S/N: 31600589 Test Certificate: 7564			
	Measured voltage	Value	400 V	Frequency	50HZ
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

3.3.2	Auxiliary circuits Power supply				
	Aim	Check the auxiliary circuits power supply.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the value of the auxiliary power supply voltage.			
	Acceptance criteria	The auxiliary circuits power supply voltage should be 230V 1P+N 50Hz.			
	Instrument	Type: HT ITALIA Mod.: HT 2100 S/N: 31600599 Test Certificate: 7564			
	Measured voltage	Value	230V	Frequency	50HZ
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

4. FUNCTIONAL TESTING.

4.1 Electrical equipment.

4.1	DP-1 operating conditions.				
	Aim	Check the functioning of the DP-1			
	Pre-requisites	N.A.			
	Test description	Check the circuit breaker, signal lamps and verify the output distribution			
	Acceptance criteria	The electrical functioning of the DP-1 must be in compliance with the following document: **01251-100-S07-E10-0002 Indoor Panel Single & Wiring Diagram**			
	Notes				
	Executed	☑ Yes ☐ No	**Result**	☑ Positive	☐ Negative
	Date	**Supplier**	**Customer**		**Client**
	17-07-21	[signature]	[signature]		[signature]

5 COMMISSIONING AND START-UP PROCEDURES DP 1 INDOOR PANEL

5.1 Preliminary operation

Before starting-up the electrical and instrumentation commissioning of Indoor Power Distribution Panel all the lighting circuit will be terminated and all the followings point should be checked and confirmed:
The indoor provide supply the internal EPM circuit and 230V 50 Hz internal and external socket.
Each circuit is controlled by the relevant circuit breaker.

5.1.1. Mechanical assembling

	Check equipment's alignment	☑
	Check all bolts fixing	☑

5.1.2 Electrical / Instrument connecting

	Check cabling connection	☑
	Check insulated test of cabling system before energizing on the outgoing	☑

After confirmation, the distribution Panel is ready for electrical test without voltage supply
Field test check
Check and Test without voltage supply

Before energising the system, all the followings point should be checked and confirmed:

	Check earthing system connection from the external grounding system to the Indoor Power Distribution Panel ground bar (PE bar).	☑
	Check and/or set all electrical protection as per the wiring diagram	☑

After confirmation, the Indoor Power Distribution Panel is ready for electrical and instrument test with power supply.

5.1.3 Check and Test with Voltage supply

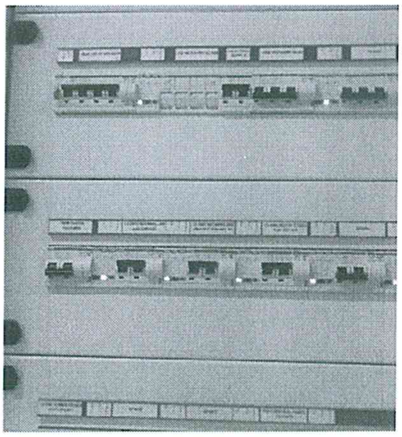
Before energizing the indoor panel, all breaker must be open.
The indoor panel DP 1 is provided with the following measuring control (see picture):



-Main circuit breaker
-Ammeter and relevant ammeter switch
-Voltmeter and relevant voltmeter switch

5.1.4 Test the circuit one by one and not at the same time in order to check correctly

Each lighting circuit is controlled by the relevant switch breaker, each breaker is equipped with 3 signal lamps green "OFF", red "ON", yellow "FAULT".



The next description includes the action for each section step by step.
For the function of each circuit breaker (Refer to the 01251-100-S07-E10-0002-Indoor Panel Single Line and Wiring Diagram)

The operation is the following:

Steps
Check the voltage supply on the 3 P+N on the Voltmeter PV1 by the voltmeter switch SV 1 close the fuse switch QU1.1
Check by the Lamp Test SB1 the correct function of the signal lamp Close the breaker QF1.1 and supply the aux. transformer for signal lamp.
By the signal lamp HL1.1/2.1/3.1 check the status of main circuit breaker
Close the main breaker QF1 to supply all circuit breaker Closed the breaker QF0 for pilot circuit emergency light
Close the Circuit Breaker QF2 to QF12 step by step to supply circuit and check the output voltage by voltmeter. For Each circuit breaker are provided the following signal lamp: -Red Lamp Circuit breaker close -Green Lamp Circuit breaker open -Yellow Lamp Fault

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EPM MODULE 030-EPM2

DP-2 Outdoor Distribution Panel

SAT

Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved

Notes:	EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.		
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	Enppi Ref.: 01251-100-S07-P06-0008 R.1		
		Language: E	Total Pages:13

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INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the Outdoor DP-2 Distribution Panel of the EPM electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied DP-2 Panel

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

1.1 Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test Procedures): the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Nadeem	ENPPI	[signature]	17/7/2021
M. Ibrahim	PPC	[signature]	17/7/2021
Cotti Cottini Fabio	CEAR	[signature]	17-07-21
	CEAR		

1.2 DOCUMENTATION

Following a list of the relevant documents used to perform the FAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001		General Arrangement
01251-100-S07-E02-0003		Outdoor Light Distribution Panel Overall Dimensions Panel Layout
01251-100-S07-E10-0003		Outdoor Panel Single & Wiring diagram.
01251-100-S07-K11-0008		EPM Filled in DP-2 Outdoor Distribution Panel Data Sheet
01251-100-S07-E05-0002		EPM Internal Cable schedule

2. TESTING STRATEGY

The testing strategy includes the following two phases.

The **Installation** testing phase is developed to test the:

- Documentation;
- Mechanical installation;
- Electrical installation.

The **Functioning** testing phase is developed to test the functioning of the:

- Electrical equipment

3. INSTALLATION TESTING.

3.1 Documentation check.

3.1	Documentation check.					
	Aim	Check the presence of the project documentation.				
	Pre-requisites	N.A.				
	Test description	Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.				
	Acceptance criteria	All the documentation listed on chapter 1.2 of the FAT procedure have to be present.				
	Notes					
	Executed	☑ Yes	☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier		Customer		Client
	17-07-21	[signature]		[signature]		[signature]

3.2 General construction Check

3.2.1	Terminal block connections.				
	Aim	Check the terminal block connections (wiring and tightening).			
	Pre-requisites	N.A.			
	Test description	Visual inspection and tightening test (with a screw driver).			
	Acceptance criteria	The terminal block connections must be in compliance with the following documents: **01251-100-S07-E10-0003 Outdoor Panel Single & Wiring Diagram** **01251-100-S07-E02-0003 Outdoor DP-2 Overall Dimension Panel Layout**			
	Instrument	Screw driver.			
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	A. Nader [signature]	[signature]	

3.2.2	Earthing connections.				
	Aim	Check the earthing connections (wiring and tightening).			
	Pre-requisites	N.A.			
	Test description	Visual inspection and tightening test (with a screw driver or a wrench).			
	Acceptance criteria	The earthing connections must be in compliance with the following documents: **01251-100-S07-E10-0003 Outdoor Panel Single & Wiring Diagram** **01251-100-S07-E99-0009 Earthing System Internal External Layout**			
	Instrument	Screw driver, Wrench.			
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	A. Nader [signature]	[signature]	

3.2.3	Electrical equipment labels.				
	Aim	Check the equipment labels.			
	Pre-requisites	N.A.			
	Test description	Visual inspection.			
	Acceptance criteria	The electrical equipment labels must be in compliance with the following document: **01251-100-S07-E02-0002 Indoor Overall Dimension Panel Layout**			
	Instrument	N.A.			
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

3.2.4	DP-2 Cleanliness of the equipment				
	Aim	Check the cleanliness of the equipment.			
	Pre-requisites	N.A.			
	Test description	Visual inspection.			
	Acceptance criteria				
	Instrument	N.A.			
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

3.2.5	**Mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc.**			
	Aim	Check the functioning of the mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc..		
	Pre-requisites	N.A.		
	Test description	Functional test of all the mechanical and electrical interlocks.		
	Acceptance criteria	All the mechanical and electrical interlocks described on the following documents must be operative: The DP-2 arrangement must be in compliance with the following documents: **01251-100-S07-E10-0003 Outdoor Panel Single & Wiring Diagram** **01251-100-S07-E02-0003 Outdoor DP-2 Overall Dimension Panel Layout**		
	Instrument	N.A.		
	Notes			
	Executed	☑ Yes ☐ No	**Result**	☑ Positive ☐ Negative
	Date	**Supplier**	**Customer**	**Client**
	17-07-2[illegible]	[signature]	[signature]	[signature]

3.3 Power supply Check

3.3.1	Main circuits Power supply			
	Aim	Check the main circuits power supply.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the value of the main power supply voltage.		
	Acceptance criteria	The main circuits power supply voltage should be 400V 3P+N 50Hz.		
	Instrument	Type: HT ITALIA Mod.: HT1100 S/N: 98600599 Test Certificate: 7544		
	Measured voltage	Value: 400V	Frequency: 50Hz	
	Notes			
	Executed	☑ Yes ☐ No	Result: ☑ Positive	☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

3.3.2	Auxiliary circuits Power supply			
	Aim	Check the auxiliary circuits power supply.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the value of the auxiliary power supply voltage.		
	Acceptance criteria	The auxiliary circuits power supply voltage should be 230V 1P+N 50Hz.		
	Instrument	Type: HT ITALIA Mod.: HT1100 S/N: 98600599 Test Certificate: 7544		
	Measured voltage	Value: 230V	Frequency: 50Hz	
	Notes			
	Executed	☑ Yes ☐ No	Result: ☑ Positive	☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

4. FUNCTIONAL TESTING.

4.1 Electrical equipment.

4.1.	DP-2 operating conditions.				
	Aim	Check the functioning of the DP-2			
	Pre-requisites	N.A.			
	Test description	Check the circuit breaker, signal lamps and verify the output distribution. Check the operation of photocell and relevant contactor.			
	Acceptance criteria	The electrical functioning of the DP-2 must be in compliance with the following document: **01251-100-S07-E10-0003 Outdoor Panel Single & Wiring Diagram**			
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative	
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

5 COMMISSIONING AND START-UP PROCEDURES DP 2 OUTDOOR PANEL

5.1 Preliminary operation

Before starting-up the electrical and instrumentation commissioning of Outdoor Power Distribution Panel all the lighting circuit will be terminated and all the followings point should be checked and confirmed:
The outdoor panel provide supply the perimetral and roof top EPM lighting circuits and all area external lighting system installed by Enppi.
Each circuit is controlled by the relevant circuit breaker.

5.1.1. Mechanical assembling

	Check equipment's alignment	☐
	Check all bolts fixing	☐

5.1.2 Electrical / Instrument connecting

	Check cabling connection	☐
	Check insulated test of cabling system before energizing on the outgoing	☐

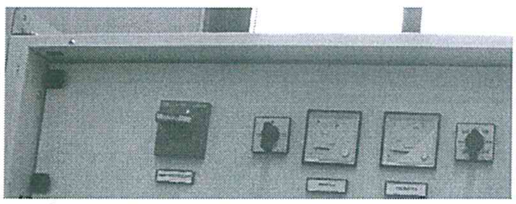
After confirmation, the distribution Panel is ready for electrical test without voltage supply
Field test check
Check and Test without voltage supply
Before energising the system, all the followings point should be checked and confirmed:

	Check earthing system connection from the external grounding system to the Indoor Power Distribution Panel ground bar (PE bar).	☐
	Check and/or set all electrical protection as per the wiring diagram	☐

After confirmation, the Indoor Power Distribution Panel is ready for electrical and instrument test with power supply.

5.1.3 Check and Test with Voltage supply

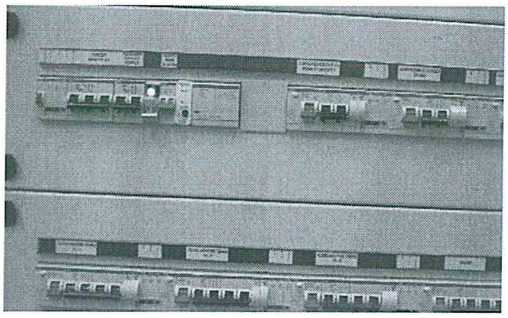
Before energizing the indoor panel, all breaker must be open.
The indoor panel DP 2 is provided with the following measuring control (see picture):

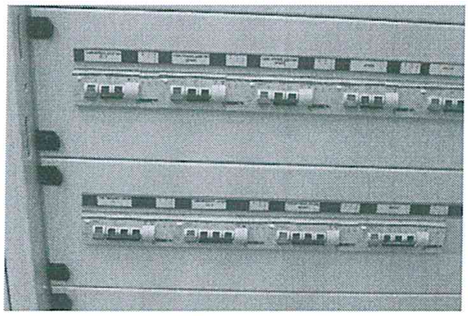


-Main circuit breaker
-Ammeter and relevant ammeter switch
-Voltmeter and relevant voltmeter switch

5.1.4 Test the circuit one by one and not at the same time in order to check correctly

Each lighting circuit is controlled by the relevant switch breaker, each breaker is equipped with 3 signal lamps green “OFF”, red “ON”, yellow “FAULT”.

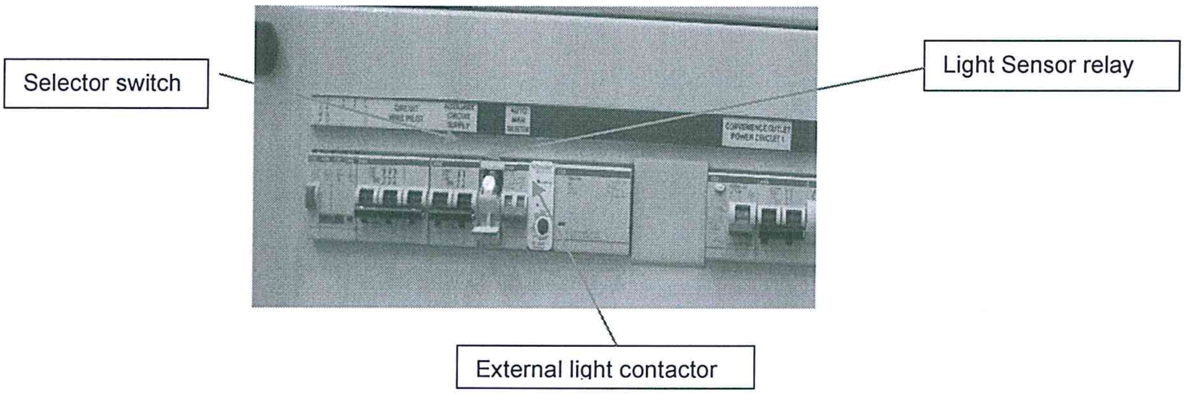




The outdoor panel is provided with the section for outdoor lighting system controlled by light sensor installed under the roof top.

This section is equipped with:
-Selector switch 3 position “Man.-0-Auto”
-Light sensor relay
In “Auto” position the lighting system is controlled by an external sensor that provide to command the contactor for external lighting system based on the daylight.

In “Manual” position the lighting system is always on, the sensor is not operated



The next description includes the action for each section step by step.
For the function of each circuit breaker (Refer to the 01251-100-S07-E10-0003 Outdoor Panel Single Line and Wiring Diagram)
The operation is the following:

Check the voltage supply on the 3 P+N on the Voltmeter PV1 by the voltmeter switch SV 1 close the fuse switch QU1.1
Check by the Lamp Test SB1 the correct function of the signal lamp Close the breaker QF 1.1 and supply the aux. transformer for signal lamp.
Close the Main Circuit breaker QF1
By the signal lamp HL1.1/2.1/3.1 check the status of main circuit breaker
Closed the breaker QF 0 for pilot circuit emergency light
Close the Circuit Breaker QF 3 QF 4 QF 5 step by step to supply all circuit convenience outlet sockets and check the output voltage by voltmeter. For Each circuit breaker are provided the following signal lamp: -Red Lamp Circuit breaker close -Green Lamp Circuit breaker open -Yellow Lamp Fault
Close the Circuit Breaker QF6 to QF13 step by step to supply all circuit and check the output voltage by voltmeter. For Each circuit breaker are provided the following signal lamp: -Red Lamp Circuit breaker close -Green Lamp Circuit breaker open -Yellow Lamp Fault

Enppi	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	CEAR COSTRUZIONI ELETTROTECNICHE CEAR s.r.l.

CRUDE OIL TANK FARM 1251-100

EPM MODULE 030-EPM2

UPDP Distribution Panel

SAT

Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
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		Language: E	Total Pages: 12

INDEX

INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the UPS Distribution Panel of the EPM electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied UPS Panel

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

1.1 Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test Procedures):the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Nadeem	ENPPI	[signature]	17/7/2021
M Ibrahim	PPC	[signature]	17/7/2021
COTTI COTTI FABIO	CEAR	[signature]	17-07-21
	CEAR		

1.2 DOCUMENTATION

Following a list of the relevant documents used to perform the FAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	General Arrangement
01251-100-S07-E02-0004	R.4	UPS Panel Overall Dimensions Panel Layout
01251-100-S07-E10-0004	R.4	UPS Panel Single & Wiring diagram.
01251-100-S07-K11-0009	R.2	EPM Filled UPS Distribution Panel Data Sheet
01251-100-S07-E05-0002	R.5	EPM Internal Cable schedule

2. TESTING STRATEGY

The testing strategy includes the following two phases.

The **Installation** testing phase is developed to test the:

- Documentation;
- Mechanical installation ;
- Electrical installation.

The **Functioning** testing phase is developed to test the functioning of the:

- Electrical equipment

3. INSTALLATION TESTING.

3.1 Documentation check.

<table>
<tr><td rowspan="9">3.1</td><td colspan="4">Documentation check.</td></tr>
<tr><td>Aim</td><td colspan="3">Check the presence of the project documentation.</td></tr>
<tr><td>Pre-requisites</td><td colspan="3">N.A.</td></tr>
<tr><td>Test description</td><td colspan="3">Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.</td></tr>
<tr><td>Acceptance criteria</td><td colspan="3">All the documentation listed on chapter 1.2 of the FAT procedure have to be present.</td></tr>
<tr><td>Notes</td><td colspan="3"></td></tr>
<tr><td>Executed</td><td>☑ Yes ☐ No</td><td>Result</td><td>☑ Positive ☐ Negative</td></tr>
<tr><td>Date</td><td>Supplier</td><td>Customer</td><td>Client</td></tr>
<tr><td>17-07-21</td><td>[signature]</td><td>[signature]</td><td>[signature]</td></tr>
</table>

3.2 INSTALLATION CHECK

3.2.1	Earthing connections.				
	Aim	Check the earthing connections (wiring and tightening).			
	Pre-requisites	N.A.			
	Test description	Visual inspection and tightening test (with a screw driver or a wrench).			
	Acceptance criteria	The earthing connections must be in compliance with the following documents: **01251-100-S07-E10-0004 UPS Single & Wiring Diagram** **01251-100-S07-E99-0009 Earthing System Internal External Layout**			
	Instrument	Screw driver, Wrench.			
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative	
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

3.2.2	UPS Cleanliness of the equipment				
	Aim	Check the cleanliness of the equipment.			
	Pre-requisites	N.A.			
	Test description	Visual inspection.			
	Acceptance criteria				
	Instrument	N.A.			
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative	
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

3.2.3	Mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc..				
	Aim	Check the functioning of the mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc..			
	Pre-requisites	N.A.			
	Test description	Functional test of all the mechanical and electrical interlocks.			
	Acceptance criteria	All the mechanical and electrical interlocks described on the following documents must be operative: The UPS arrangement must be in compliance with the following documents: **01251-100-S07-E10-0004 UPS Single & Wiring Diagram** **01251-100-S07-E02-0004 UPS Overall Dimension Panel Layout**			
	Instrument	N.A.			
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

3.3 POWER SUPPLY CHECK

<table>
<tr><td rowspan="11">3.3.1</td><td colspan="4">Main circuits Power supply</td></tr>
<tr><td>Aim</td><td colspan="3">Check the main circuits power supply.</td></tr>
<tr><td>Pre-requisites</td><td colspan="3">N.A.</td></tr>
<tr><td>Test description</td><td colspan="3">Check the presence and the value of the main power supply voltage.</td></tr>
<tr><td>Acceptance criteria</td><td colspan="3">The main circuits power supply voltage should be 400V 3P+N 50Hz.</td></tr>
<tr><td>Instrument</td><td colspan="3">Type: HT ITALIA
Mod.: HT 8100 S/N : 88600589
Test Certificate: 7544</td></tr>
<tr><td>Measured voltage</td><td>Value 400V</td><td>Frequency</td><td>50 HZ</td></tr>
<tr><td>Notes</td><td colspan="3"></td></tr>
<tr><td>Executed</td><td>☒ Yes ☐ No</td><td>Result</td><td>☒ Positive ☐ Negative</td></tr>
<tr><td>Date</td><td>Supplier</td><td>Customer</td><td>Client</td></tr>
<tr><td>17-07-21</td><td>[signature]</td><td>[signature]</td><td>[signature]</td></tr>
</table>

<table>
<tr><td rowspan="11">3.3.2</td><td colspan="4">Auxiliary circuits Power supply</td></tr>
<tr><td>Aim</td><td colspan="3">Check the auxiliary circuits power supply.</td></tr>
<tr><td>Pre-requisites</td><td colspan="3">N.A.</td></tr>
<tr><td>Test description</td><td colspan="3">Check the presence and the value of the auxiliary power supply voltage.</td></tr>
<tr><td>Acceptance criteria</td><td colspan="3">The auxiliary circuits power supply voltage should be 230V 1P+N 50Hz.</td></tr>
<tr><td>Instrument</td><td colspan="3">Type: HT ITALIA
Mod.: HT 8100 S/N : 88600589
Test Certificate: 7544</td></tr>
<tr><td>Measured voltage</td><td>Value 230V</td><td>Frequency</td><td>50 HZ</td></tr>
<tr><td>Notes</td><td colspan="3"></td></tr>
<tr><td>Executed</td><td>☒ Yes ☐ No</td><td>Result</td><td>☒ Positive ☐ Negative</td></tr>
<tr><td>Date</td><td>Supplier</td><td>Customer</td><td>Client</td></tr>
<tr><td>17-07-21</td><td>[signature]</td><td>[signature]</td><td>[signature]</td></tr>
</table>

4. FUNCTIONAL TESTING.

4.1 Electrical equipment.

4.1.	UPS operating conditions.			
	Aim	Check the functioning of the UPS		
	Pre-requisites	N.A.		
	Test description	Check the circuit breaker, signal lamps and verify the output distribution		
	Acceptance criteria	The electrical functioning of the UPS must be in compliance with the following document: **01251-100-S07-E10-0004 UPS Single & Wiring Diagram**		
	Notes			
	Executed	☑ Yes ☐ No	**Result**	☑ Positive ☐ Negative
	Date	**Supplier**	**Customer**	**Client**
	17-07-21	[signature]	[signature]	[signature]

5 COMMISSIONING AND START-UP PROCEDURES UPS PANEL

5.1 Preliminary operation

The UPS panel provide to fed the auxiliary and command circuit of the LVSWG MCC panel the power supply of the F&G panel, the supply for external shut down valve and the Tank Radar Gauging.
The UPS is powered from the Enppi UPS Substation so as to guarantee continuity of power supply even in the event of a power loss.

Before starting-up the electrical and instrumentation commissioning of UPS Panel all connection with the other panel will be terminated and all the followings point should be checked and confirmed:
The circuit breakers of the others panel connected to the UPS panel must be in open position.

Each circuit is controlled by the relevant circuit breaker.

5.1.1. Mechanical assembling

	Check equipment's alignment	☑
	Check all bolts fixing	☑

5.1.2 Electrical / Instrument connecting

	Check cabling connection	☑
	Check insulated test of cabling system before energizing on the outgoing	☑

After confirmation, the UPS Panel is ready for electrical test without voltage supply
Field test check
Check and Test without voltage supply

Before energising the system, all the followings point should be checked and confirmed:

	Check earthing system connection from the external grounding system to the Indoor Power Distribution Panel ground bar (PE bar).	☑
	Check and/or set all electrical protection as per the wiring diagram	☑

After confirmation, the UPS Panel is ready for electrical and instrument test with power supply.

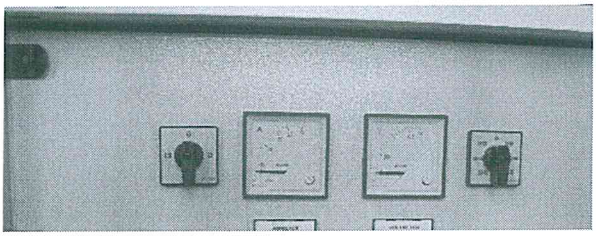
5.1.3 Check and Test with Voltage supply

Before energizing the indoor panel, all breaker must be open.

Require to Enppi supervisor to close the power circuit breaker in the UPS Substation and verify the voltage value.

The verification and the connection of the power supply cable is in charge to Enppi

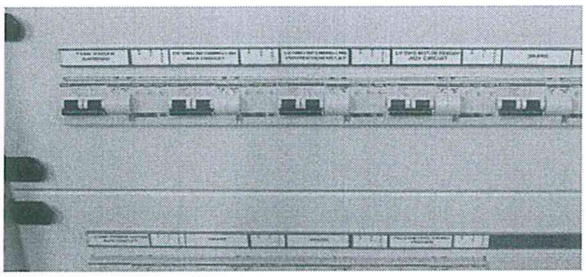
The UPS panel is provided with the following measuring control (see picture):



-Main circuit breaker
-Ammeter and relevant ammeter switch
-Voltmeter and relevant voltmeter switch

5.1.4 Test the circuit one by one and not at the same time in order to check correctly

Each lighting circuit is controlled by the relevant switch breaker, each breaker is equipped with 3 signal lamps green “OFF”, red “ON”, yellow “FAULT”.



The next description includes the action for each section step by step.
For the function of each circuit breaker (Refer to the 01251-100-S07-E10-0003 Outdoor Panel Single Line and Wiring Diagram)

The operation is the following:

Check the voltage supply on the 3 P+N on the Voltmeter PV1 by the voltmeter switch SV 1 close the fuse switch QU1.1
Check by the Lamp Test SB1 the correct function of the signal lamp Close the breaker QF 1.1 and supply the aux. transformer for signal lamp.
Close the Main Circuit breaker QF1
By the signal lamp HL1.1/2.1/3.1 check the status of main circuit breaker
Close the Circuit Breaker QF 2 to QF 12 step by step to supply all circuit and check the output voltage by voltmeter. For each circuit breaker are provided the following signal lamp: -Red Lamp Circuit breaker close -Green Lamp Circuit breaker open -Yellow Lamp Fault

Enppi	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	CEAR

CRUDE OIL TANK FARM 1251-100

EPM MODULE

HVAC

Pre commissioning and Commissioning

Site Integration Test Procedures

AGROOD

030-EPM-02

2	07/12/2020	Approval	BP	LS	GA		
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0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved

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INDEX

1 INTRODUCTION PRECOMMISSIONING AND COMMISSIONING PROCEDURE

The Precommissioning and Commissioning and Site Integration Test Procedures consists in 2 documents which are to be used to proceed in the final commissioning at site.

Personnel involved in the Site Integration Test

The table below shows the people who participate at the activity of the Commissioning and Site Integration Test: the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Assem Affify	ENPPI	[signature]	04-08-2021
	ENPPI		
Giovannino Pala	CEAR	Giovannino Pala	04/08/2021
	CEAR		

2. DOCUMENTS

Following a list of the relevant documents may be used to perform the Precommissioning and Commissioning Test (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-C03-0001	R.7	HVAC and Pressurization System Calculation
01251-100-S07-C04-0001	R.4	HVAC Catalogues and data sheet
01251-100-S07-C99-0005	R.7	External Static Pressure calculation for fans
01251-100-S07-C99-0006	R.3	HVAC SYSTEM FAT & SAT
01251-100-S07-D99-0004	R.5	HVAC Drawing Plan Layout
01251-100-S07-D99-0015	R.6	HVAC Roof Top General Arrangement
01251-100-S07-E10-0005	R.4	HVAC Roof Panel Single & Wiring Diagram
01251-100-S07-E10-0006	R.4	HVAC Contr. Panel Single & Wiring Diagram
01251-100-S07-K09-0001	R.6	EPM Main Eq. Data Sheet HVAC
01251-100-S07-K07-0001	R.4	HVAC Schematic Flow Diagram
01251-100-S07-K15-0001	R.2	HVAC Material Safety Data Sheet
01251-100-S07-C99-0007	R.3	Start up form and operation guide

2.1 SYSTEM DESCRIPTION

The shelters are air conditioned and ventilated by means of a Packaged air conditioning units Roof Top type (RT-A & RT-B), constant air volume, with built-in electrical heating coil. These units are provided redundant such that in case of failure of duty unit, the 100% capacity stand-by unit starts and guarantee the required building design conditions.
Each Roof Top unit is equipped with onboard panel complete with signal lamps multi led type and selector switch.
Each electrical component is protected by automatic breaker located in the switchboard.
Each Roof Top unit is it is equipped with a motorized exclusion dampers.
Cooling or heating system are controlled through the temperature set points that can be set on the operator panel HMI located in the main control panel in electrical room.
Fresh air intake completes with sand trap louver with wire mesh installed on the common plenum duct.
Fresh air intake motorized volume damper installed on each Roof Top units.
The room differential overpressure is monitored from the HMI panel by a pressure transmitter installed in the electrical room.
Transformer room is provided with two exhaust fans (EXF-01 and EXF-02), one duty and one in stand-by.
Duct crossing the fire rated wall cut-outs are provided with a combination of motorized fire & smoke isolation dampers.
RT-A(duty) and RT-B (stand-by) shall have an operating cycle of 7 days interval.
In case of the stand by RT shall be isolated for maintenance (opening the main breaker on the onboard panel or main breaker on the main LCP panel) the HMI system will see a malfunction and RT on duty shall continue to run until breaker malfunction reset of stand-by unit.
When a RT unit is commanded at the start the onboard motorized dampers will open.
When a RT unit is in stop the onboard motorized dampers are closed.
In normal condition each RT units shall be ready to work at any time (400V 3ph+N).
When the LCP panel commands the system to shut down, both operating and stand-by RTs shall stop also all motorized dampers (onboard and F&G dampers) shall close, system reset shall be done manually when the alarm has been cleared.
In case of equipment failure or any HVAC alarm signals an audible alarm shall be initiated and visual indication shall be displayed al LCP panel.
Audible alarm shall have the provision to be mute silenced, however visual alarm shall last until fault is attended and reset.

3 PRECOMMISSIONING AND COMMISSIONING PROCEDURE

3.1 INTRODUCTION

The purpose of this HVAC test procedure is to provide guidelines to ensure that all installed HVAC equipment is tested in a safe and controlled manner whilst confirming compliance with building requirements and design intent.

3.2 REFERENCE DOCUMENTS

01251-100-510-16-7-E10-005	HVAC System On board Control Panel
01251-100-510-16-7-E10-006	HVAC System Main Electrical Control Panel
01251-100-S07-E99-0003	HVAC Control philosophy & logic diagram
01251-100-S07-K07-0001	HVAC and pressurization system Schematic flow Diagram
01251-100-S07-E99-0004	HVAC AND PRESSURIZATION SYSTEM Electrical load list

3.4 TECHNICAL STRATEGY

Prior to carrying out any HVAC testing mechanical completion of all construction activities for any given system must be complete with all installation and testing certification correctly completed as per ACS requirement. In addition to this any control systems required to allow completion of a HVAC test must have been successfully Site Acceptance Tested with a mechanical completion handover accepted.
The action of ESD signals will be tested during ESD Cause & Effect checks.
So, all activities related to F&G and ESD tests are not considered in this procedure. And they will be described in the relevant commissioning procedures.

Recommended personnel to execute HVAC tests:

- HVAC tests will be the overall responsibility of the CEAR commissioning team.
- It is envisaged that a third-party contractor will provide commissioning teams (Engineers, Senior Technicians and Technicians) to carry out pre-commissioning of the HVAC. These personal will be an integrated part of the CEAR commissioning team.
- Commissioning technicians will be positioned in the field, liaising with Control room Technicians via radio.
- Full time Vendor and EC / or systems support will also be required on site.

3.5 COMMISSIONING PRE-REQUISITES

- Mechanical Completion of sub-system has taken place and has been custody transferred to the commissioning team.
- Commissioning of F&G system is completed prior to energization of HVAC system.
- All necessary Permits to Work are prepared by EC and ready to implementation.
- The job pack is complete and available for inspection.

The job pack shall contain:

- "As built" by Construction loop sheet (if applicable);
- Data sheet;
- Relevant HVAC equipment or Instrument check sheet;
- Calibrated measurement devices;
- Updated calibration certificates for the measurement devices.

4 HEALTH, SAFETY AND ENVIRONMENT

General Requirements

When implementing the loop check each employee involved in commissioning process shall be aware of and strictly comply with all internal CEAR Safety instructions

All personnel shall be familiarized with the plan of the works to be implemented. Also, they shall know the actions and means of notification upon occurrence of emergencies.

All personnel shall be provided with the standard personal protective equipment (PPE). All the fire detection and fire-extinguishing equipment shall be checked to ensure it is an operational condition.

Prior to the commencement of HVAC testing each commissioning engineer involved shall ensure there is adequate lighting, safe access and exit, fire-fighting equipment and communications provided and that the area is clear of debris.

All necessary permits to work (PTW) shall be completed and approved prior to work starting.

No work will be undertaken, regardless of the urgency, unless it fully complies with all the site safety procedures and environmental procedures.

Erect barriers and signs around test areas prohibiting entry of unauthorised and non-test personnel

Precautions and Equipment required

- All personnel shall be familiarized with the plan, procedures and regulations applicable to this type of work.
- Proven suitable tools shall be used.
- Work crew consisting of, at least, 2 people shall work in the field.
- Stable radio communication shall be provided.

5. PRE-COMMISSIONING AND COMMISSIONING REQUIREMENTS

Commissioning Consumables

- Barrier tapes (caution/ no entry/danger).
- Caution and warning labels and signs.
- Cleaning materials (Cleaning cloths, lint free).

Tools and Test Equipment with the relevant calibration test certificate

- Hand tools.
- Radio.
- Daily recorder of temperature and humidity.
- Digital thermo hydrometer.
- Air flow meter.

- Windmill anemometer.
- Clamp-on ammeter.

Manpower

- Test engineer – in charge and supervises work of the team.
- HVAC technicians – work with Instrument devices and HVAC equipment in the field.

Vendor requirement

Full time Cear/Frigotermica technicians and / or systems support shall also be required on the site.

Method Statement

This section below gives specific details and guidelines for HVAC test. The manufactures vendor manuals could be used for additional information.

Method statement includes some main sections as follows:

- Loop check of instruments such as dampers, transmitters, valves.
- Dynamic performance test and air balancing.

6 PRE-COMMISIONING & COMMISSIONING

6.1 PRELIMINARY CHECKS

		ITEM		
No	Action	Positive/ Negative	Signature	Date
01	Duct work inspection to check duct sealing	P		
02	Check control panel installation and cable termination	P		
03	Check the panel is fully energize	P		
04	Check the HMI in MCC room	P		
05	Check the sequence of operation (appendix 1)	P		

6.2 TEST OF FIRE DAMPER

		ITEM		
No	Action	Positive/ Negative	Signature	Date
01	Carry out a visual check of the FD to ensure that is correct: • Tagging • mounting, cable installation • cable termination and grounding	P		
02	Command to open the electric FD	P		
03	Ensure that deenergized FD is in normally closed position	P		
04	Check the position indication (micro switch) that HVAC main control panel is receiving from damper actuator indicating the FD position	P		

6.3 TEMEPERATURE/HUMIDITY TRANSMITTER TEST

		ITEM		
No	Action	Positive/ Negative	Signature	Date
01	Carry out a visual check of the instrument to ensure the tagging, mounting, cable installation, cable termination and grounding is correct, spare entries are correctly plugged. Ensure that PLC HMI screens display fault signal for this not energized transmitter.	P		
02	Energize the instrument in HVAC PANEL for relevant transmitter. Ensure that the instrument is powered up and the point is active on the PLC HMI screens.	P		

04-08-2021

Giovanni Pola
04/08/2021

6.4 PRESSURE SWITCH TEST

		ITEM		
No	Action	Positive/ Negative	Signature	Date
01	Carry out a visual check of the instrument to ensure all tagging, mounting, cable installation.	P		
02	Connect multi-meter to the instrument. Apply the pressure, slowly raising if checking of high-pressure set-point (PDSH) and slowly lowering if checking of low pressure set-point (PDSL). Record pressure value when relay activates.	P		

6.5 HVAC UNITS TEST

		ITEM		
No	Action	Positive/ Negative	Signature	Date
01	Carry out a visual check of the indoor and outdoor unit to ensure the tagging; mounting; instruments, cables, installation, cable termination and grounding is correct, there are no any mechanical damages.	P		
02	Make sure the refrigerant status indicator (sight glass) indicates the normal condition of refrigerant. If it indicates abnormal condition it is required to replace refrigerant involving commissioning mechanicals and support of construction people.	P		
03	Run axial fans installed in outdoor condensing unit. Check sense of rotation. Energise electrical crankcase heater of compressor lube oil. The minimum period recommended for energizing oil heater prior to start up the compressors is 6 hours.	P		
04	Check the refrigerant pressure gauge	*		

* Cear rep hasn't brought the pressure gauge to do the refrigerant test, However the two units RT-A & RT-B have been properly worked during the commissioning activity, and there is no alarm for high pressure —

Ahe... 04/08/2021

Giovanni Pola
04/08/2021

No	Action	Positive/ Negative	Signature	Date
05	Start the unit and provide its run-in during 8 hours prior to fill in the check sheets. Measure the electrical parameters, pressure and temperature of evaporator & condenser, compressor oil level. All the measured parameters should not exceed limits specified in operation and maintenance manual.	P		
06	Check the interlock and intervention of following protection: refrigerant high-pressure switch refrigerant low-pressure switch lube oil low pressure switch	P		
07	Check the correct operation of inverter controlling the condenser fan speed via pressure transmitter installed on refrigerant piping	NA		
08	Check total static pressure through the unit	*		
09	Check equipment noise	P		
10	Check equipment and air duct vibration	P		
11	Measurement that denotes the equipment cooling capacity (such as air temperature in/out, humidity and flow rate)	P		
12	Check the equipment vibration	P		

* Cear rep advised that static pressure test already has been acheved Because of the flow rate required by design already achived and has been verified by measurment during commissioning.

2nd addition to the above, cear rep advised that the st.pr test is required to make holes in supply and return air duct and it is difficult to be done after installation

[signature] 04/08/2021 Giovanni Pola 04/08/2021

Measured Data

1- Roof top -A (RT-A)

Motor	Current (A)			Rated current (A)
	A	B	C	
Supply fan	2.6	2.7	2.7	3.8
Compressor-01	5.3	5.5	5.9	11.1
Condenser fan-01	0.8	1	0.9	1.1
Compressor-02	5.3	5.6	5.8	11.1
Condenser fan-02	0.9	1	1	1.1
Electric heater	8.3	8.4	8.5	8.6

1- Roof top -B (RT-B)

Motor	Current (A)			Rated current (A)
	A	B	C	
Supply fan	2.6	2.8	2.7	3.8
Compressor-01	5.7	5.5	5.6	11.1
Condenser fan-01	0.9	0.9	0.9	1.1
Compressor-02	5.4	6.4	5.4	11.1
Condenser fan-02	0.9	0.9	1	1.1
Electric heater	8.4	8.4	8.4	8.6

Assem Affify 05/08/2021

Giovanni Pala 05/08/2021

6.6 EXHAUST FANS TRANSFORMER ROOM

"EXF-A" & "EXF-B"

INSPECTION RESULTS

1- Correct installation ok
2- Fastener ok
3- Functional control ok
4- Air passage ok
5- Damages ok
6- Accessories ok
7- Grounding ok
8- Rotation sense ok
9- Setting of thermic relays ok

Measured data:

A) Exhaust Fan motor

	current (A):			Rated current
Fan #1	1a) 1	1b) 0.9	1c) 0.1	1.06
Fan #2	2a) 0.9	2b) 1	2c) 0.9	1.06

NOTE

04/08/2021

Giovanni Pola
04/08/2021

6.7 AIR DUCT DISTRIBUTION

OPERATIONS DESCRIPTION

1- Open setting dampers ok
2- Open fire-dampers ok
3- Open dampers, grilles ok
4- Verify internal cleaning ok
5- Before start the fans cover delicate instruments ok
6- After fans start up verify there aren't air losses ok
7- Verify and check the integrity of the thermal insulation and outer cladding ok
8- Perform Factory air duct leakage type test for one EPM ok

OPERATIONS DESCRIPTION

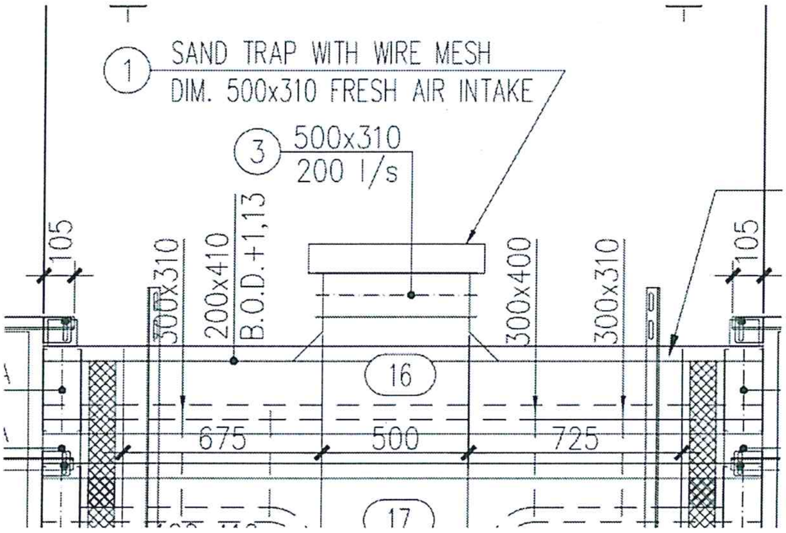
Measure with windmill anemometer the regular air distribution at the exit of the diffusers and on the return grills in conformity with the documents:

GRILLE	Location	Velocity ~~Flow rate~~ Measure n.1 m/S	Velocity ~~Flow rate~~ Measure n.2 m/S	Velocity ~~Flow rate~~ Measure n.3 m/S	avg. Vel ~~Flow rate~~ Measure n.4 m/S	Flow rate L/S
Return grille	Floor	0.63/0.61	0.53/0.62	0.68/0.7	0.63	236
Return grille	Floor	0.73/0.74	0.83/0.80	0.87/0.8	0.8	291
Supply Diffuser grille	Elec. Room	3.3	3.	2.8	3.3	241
Supply Diffuser grille	Elec Room	3.0	3.5	3.0	3.2	241
Supply Diffuser grille	Elec Room	3.1	2.90	3.6	3.26	245
Supply Diffuser grille	Elec Room	2.5	2.37	2	2.29	174
Supply Diffuser grille	Air lock	2.13	1.23	2.19/1.18	1.68	25

Tolerance accepted +/- 10 %

[signature] 04-08-2021   Giovanni Pala 04/08/2021

3. Fresh air intake – manual damper pos. 3



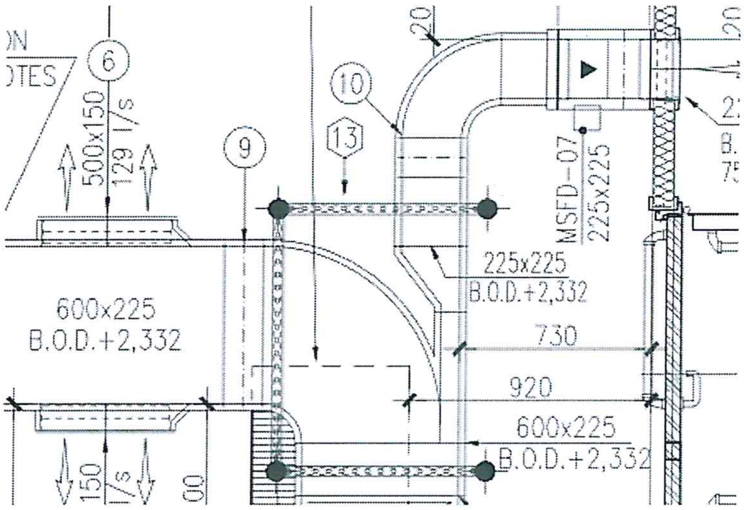
Performance test shall be executed only after system commissioning. If the air conditioning system will be started after a period of stand-by, the temperature performance test shall start after about 12 hours of operation.

7.0 PERFORMANCE TEST AND AIR BALANCING

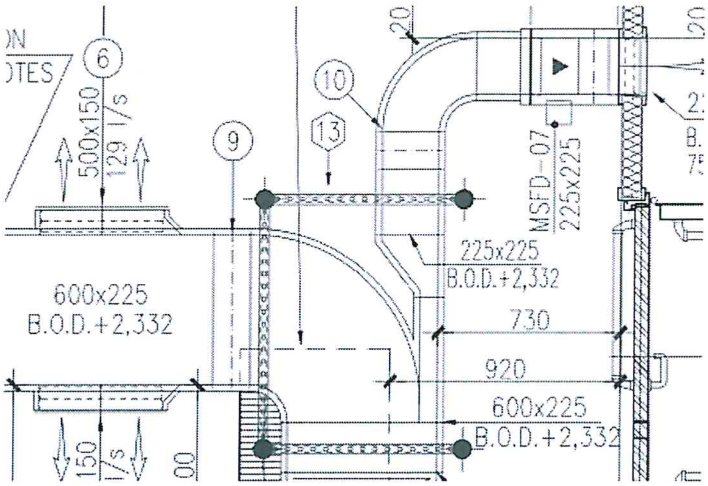
Air balancing will be performed in order to regulate air flow between the following manual dampers:
Air supply to MCC room
Air supply to Air lock
Fresh air intake

By modulating the below manual dampers refer to the drawing and document:
01251-100-S07-C04-0001 HVAC Catalogues and Data Sheet
01251-100-S07-D99-0004 HVAC Drawing Plan Layout

1. MCC room – manual damper pos. 9



2. Air lock – manual damper pos. 10



8.0 PRELIMINARY ACTIVITIES COMMON FOR ALL EPM

Action common for both summer and winter test
Note: Final actual performance test shall be done during the peak summer time

BLDG				
No	Action	Positive/ Negative	Signature	Date
1	During indoor temperature monitoring, install the inspected thermo hydrometer at 1m from floor level in position not damaged directly from the main heat gains. If HVAC system required temperature transmitter within the room subject of the test, locate thermo hydrometer as close as possible to it	P		
2	Check that all doors are closed and openings are sealed.	P		
3	Record the readings of thermo hydrometer for ~~12~~ 4 hours.	* P		
4	Check the internal and external temperature with manual thermometer (set) every 2 hours noting all the results (not in the night hours).	* P		
5	Ensure that during these operations the doors shall be closed and opened only upon approval of involved technicians.	P		
6	Set in Automatic mode all HVAC control system	P		
7	Ensure that all internal wall dampers (FD) and external wall dampers are opened (not applicable for damper of the smoke exhaust duct)	P		
8	For the units that are dual and redundant. Simulate failure of working unit and make sure that stand-by unit is entering in operation.	P		
9	Simulate a fire and gas scenario	P		
10	Simulate that two units are down	P		
11	Overall control system performance in control of dampers, temperature, safety and emergency logic. Indoor overpressure	P		

* the test has been performed in 4 Hours

07/08/2021

Giovanni Pola 04/08/2021

9.0 RECORDING

RECORDING WITH TERMOMETER DATA LOGGER

TIME	8,00	10,00	12,00	14,00	16,00	18,00	20,00	22,00	24,00	2,00	4,00	6,00
INDOOR TEMP. ° C.			23.0	22.1	23	22.3						
INDOOR HUMIDITY rh%			38.5	51	40	56.0						
OUTDOOR TEMP. ° C			33.5	34.8	37.5	39						
OUTDOOR HUMIDITY rh%			26.5	25.0	20.9	19						
SUPPLY AIR FLOW RATE READING [mc/h] L/S			902	902	902	902						
RETURN AIR FLOW RATE READING [mc/h] L/S			521	521	521	521						
INTERNAL OVERPRESSURE READING [Pa]			2.5	2.5	2.5	2.5						

SPOT MANUAL TEMPERATURE READING (EVERY 2 HOURS)

TIME	8,00	10,00	12,00	14,00	16,00	18,00
INLET TEMP. SWIT. ROOM			23.6	22.0	24	23.3
INLET TEMP. TRAFO ROOM			30	30	30	31.6

Test result:

☑ Positive ☐ Negative ☐ With reserve

Technician: Giovannino Pala Sign: [signature] Date: 4/08/2021

Client : Mohamed Abdel Salam Sign: [signature] Date: 4/8/2021

Enppi: Adem Affia sign: [signature] 04/08/2021

Enppi	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	CEAR

CRUDE OIL TANK FARM
1251-100

EPM MODULE 030-EPM2

SAT

Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved

Notes:	EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.		
	Contract Number: 1251-100-500-16		
	Enppi Ref.: 01251-100-S07-P06-0001 R.1		
		Language: E	Total Pages: 19

INDEX

INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the SAT Commissioning and Site Integration Test Procedure for the EPM Electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied EPM

Definition:
Supplier: CEAR

Customer: ENPPI

Client: PPC

TESTING STRATEGY

The testing strategy includes the following two phases.

The Installation testing phase is developed to test the:

- Documentation;
- Mechanical installation;
- Electrical installation.
-

The Functioning testing phase is developed to test the functioning of the:

- Mechanical equipment's

Electrical equipment's

Safety precaution

Before the beginning of the test brief safety induction will be done to all the people attending the test.
We will describe the company safety rules and the rules to be followed while attending the test.

Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test): the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed ...	ENPPI	[signature]	17/7/2021
Mohamed Ibrahim	PPC	[signature]	17/7/2021
...	CEAR	[signature]	12-07-21
	CEAR		

Section 1: EPM DESIGN & FABRICATION

DESCRIPTION OF THE TESTS

Visual test

Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages on the welds.

Dimensional Check

Dimensional Check will be performed to check if the dimensions of the component are in tolerances as per manufacturing drawings.

Surface Painting & Coating Check

Surface Painting check will be performed to check the painting coating and final internal/external color.

Identification and Marking Check

Identification and Marking Check will be performed to verify the correct nameplate of the EPM Module

1.1 Documentation

Following a list of the relevant documents used to perform the SAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R,7	EPM General Arrangements
01251-100-S07-B04-0001	R.5	EPM Foundation Drawings
01251-100-S07-B05-0001	R.2	EPM Doors drawing and fire rating
01251-100-S07-B05-0002	R.1	EPM False floor and fire rating
01251-100-S07-B05-0003	R.1	EPM Roof Accessibility
01251-100-S07-B05-0005	R.1	EPM Sandwich Walls Panel-Internal Partition
01251-100-S07-D01-0001	R.3	EPM Detail Design Fabrication Drawings
01251-100-S07-P05-0001	R.4	Surface Preparation Painting & Coating Procedures
01251-100-S07-D04-0001	R.2	EPM Nameplate format drawing
01251-100-S07-D99-0003	R.2	Transformer Dragging System Layout
01251-100-S07-D99-0001	R.2	EPM Lifting Pad Eyes Layout
01251-100-S07-D99-0002	R.2	EPM Centre of gravity Location Layout

1.1	Documentation check			
	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 1.2		
	Acceptance criteria	All the documentation listed on chapter 1.1 Section 1 of the FAT procedure have to be present.		
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

1.2 Visual Check

<table>
<tr><td rowspan="9">1.2</td><td colspan="4">Visual Check</td></tr>
<tr><td>Aim</td><td colspan="3">Visual check of the good construction of the EPM</td></tr>
<tr><td>Pre-requisites</td><td colspan="3">N.A.</td></tr>
<tr><td>Test description</td><td colspan="3">Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages on the welds.</td></tr>
<tr><td>Acceptance criteria</td><td colspan="3">Visual test and relevant photo</td></tr>
<tr><td>Notes</td><td colspan="3"></td></tr>
<tr><td>Executed</td><td>☒ Yes ☐ No</td><td>Result</td><td>☒ Positive ☐ Negative</td></tr>
<tr><td>Date</td><td>Supplier</td><td>Customer</td><td>Client</td></tr>
<tr><td>17-07-21</td><td>[signature]</td><td>[signature]</td><td>[signature]</td></tr>
</table>

Section 2: EPM ELECTRICAL INSTALLATION

DESCRIPTION OF THE TESTS

Visual test

General visual test will be performed to verify the good workmanship

Internal and External Lighting System

Visual test and functional test will be performed as per the relevant documentation

Electrical Safety Check Lighting System

Safety check insulation and dielectric test

Internal raceway and EPM wiring

Visual inspection of the raceway and internal EPM wiring

Identification and Marking Check

Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test): the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Nadeem	ENPPI	[signature]	17/7/2021
M. Ibrahim	PPC	[signature]	17/7/2021
Cott. Cottini Fabio	CEAR	[signature]	17-07-21
	CEAR		

2.1 Documentation.

Following a list of the relevant documents used to perform the SAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-E99-0008	R.3	Lighting and Small Power System Electrical Layout
01251-100-S07-E99-0011	R.4	Cable Routing Power & Lighting Layout
01251-100-S07-C99-0001	R.3	Lighting Lux Level Calculation
01251-100-S07-K09-0004	R.4	EPM Ancillaries Supplier Data Sheet

2.1	Documentation check			
	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 2.1.		
	Acceptance criteria	All the documentation listed on chapter 2.1 Section 2 of the SAT procedure have to be present.		
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

2.2 Internal and External Lighting system

2.2.1	**Internal and External Lighting Fixtures and Small Power system layout**				
	Aim	Verify the installation of the fixtures and the small power system of the EPM Module.			
	Pre-requisites	N.A.			
	Test description	The installation and the material must be in compliance with the values reported on the following documents: **01251-100-S07-E99-0008 Lighting and Small Power System Layout** **01251-100-S07-D99-0011 Cable routing Power & Lighting Layout** **01251-100-S07-K09-0004 Ancillaries supplier data sheet**			
	Acceptance Criteria	Visual check and quantity check of the equipment			
	Notes				
	Executed	☑ Yes ☐ No	**Result**	☑ Positive	☐ Negative
	Date	**Supplier**	**Customer**	**Client**	
	17-07-11	[signature]	[signature]	[signature]	

2.2.2	Internal and External Lighting Fixtures Functional Test			
	Aim	Verify the proper operation of the internal and external EPM lighting system.		
	Pre-requisites	Energize the indoor and outdoor distribution boards with 400 V 3P+N		
	Test description	The test must be in compliance with the following documents: **01251-100-S07-E99-0008 Lighting and Small Power System Layout** **01251-100-S07-K09-0004 Ancillaries supplier data sheet** **01251-100-S07-E10-0002 Indoor Panel Single Line diagram** **01251-100-S07-E10-0003 Outdoor Panel Single Line Diagram** **01251-100-S07-D99-0011 EPM Cable routing & Lighting Layout** **01251-100-S07-C99-0001 Lighting Lux level Calculation**		
	Acceptance Criteria	Single Test of the various lighting circuit as defined in the electrical documentation. Check the correct function of the emergency light fixtures external and internal Check the correct function of the twilight switch and the emergency line circuit		
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

2.2.3	Small Power system Functional test	
	Aim	Verify the proper operation of the internal and external EPM receptacles
	Pre-requisites	Supply the indoor and outdoor distribution with 400 V 3P+N
	Test description	The test must be in compliance with the following documents: **01251-100-S07-E99-0008 Lighting and Small Power System Layout** **01251-100-S07-K09-0004 Ancillaries supplier data sheet** **01251-100-S07-E10-0002 Indoor Panel Single Line diagram** **01251-100-S07-E10-0003 Outdoor Panel Single Line Diagram** **01251-100-S07-D99-0011 EPM Cable routing & Lighting Layout**
	Acceptance Criteria	Single Test of the small power system circuit as defined in the electrical documentation. Check the correct function of the small power system external and internal
	Notes	

Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
Date	Supplier	Customer	Client
17-07-21	[signature]	[signature]	[signature]

Section 3: EPM LIGHTNING SYSTEM

DESCRIPTION OF THE TESTS

Visual test
General visual test will be performed to verify the good workmanship

Lightning System
Visual test and continuity check of the earthing system will be performed as per the relevant documentation

Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test) the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Kadem	ENPPI	[signature]	17/7/2021
M-Ibrahim	PPC	[signature]	17/7/2021
Corr. Cottini Fabio	CEAR	[signature]	17-07-21
	CEAR		

3.1 Documentation.

Following a list of the relevant documents used to perform the SAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	General Arrangement
01251-100-S07-E99-0010	R.4	Lightning System General Layout
01251-100-S07-C99-0008	R.3	Lightning Protection Calculation

3.1.1	Documentation check				
	Aim	Check the presence of the project documentation.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the state of the documentation listed on chapter 3.1			
	Acceptance criteria	All the documentation listed on chapter 3.1 Section 3 of the SAT procedure have to be present.			
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

3.2 Lightning System

<table>
<tr><td rowspan="8">3.2.1</td><td colspan="4">Lightning system layout installation</td></tr>
<tr><td>Aim</td><td colspan="3">Verify the installation of the EPM lightning system</td></tr>
<tr><td>Pre-requisites</td><td colspan="3">N.A.</td></tr>
<tr><td>Test description</td><td colspan="3">The installation and the material must be in compliance with the following document:
01251-100-S07-E99-0010 Lightning System Layout</td></tr>
<tr><td>Acceptance Criteria</td><td colspan="3">Visual check and quantity check of the equipment</td></tr>
<tr><td>Notes</td><td colspan="3">* Lightning rods installation to be Completed</td></tr>
<tr><td>Executed</td><td>☑ Yes ☐ No</td><td>Result</td><td>☐ Positive ☐ Negative</td></tr>
<tr><td>Date
17-07-21</td><td>Supplier
[signature]</td><td>Customer
[signature]</td><td>Client
[signature]</td></tr>
</table>

3.2.2	Lightning system continuity check			
	Aim	Verify the continuity of the EPM lightning system		
	Pre-requisites	N.A.		
	Test description	The installation and the material must be incompliance with the following document: **01251-100-S07-E99-0010 Lightning System Layout**		
	Acceptance Criteria	The resistance measured shall be at least < Ω.		
	Instrument	Type: MEGGER Mod.: MIT 420-2 S/N : / Test Certificate : /		
	Notes	< 1 Ω		
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

Section 4: EPM MCT Multicable Transition System

DESCRIPTION OF THE TESTS

Visual test
General visual test will be performed to verify the good workmanship

Identification and Marking Check

Personnel involved in the SAT.

The table below shows the people who participate at the activity of the SAT ((Commissioning and Site Integration Test) the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Shaheen	ENPPI	[signature]	17/7/2021
M. Ibrahim	PPC	[signature]	17/7/2021
COTTI Cotti FABIO	CEAR	[signature]	17-07-21
	CEAR		

4.1 Documentation.

Following a list of the relevant documents used to perform the sAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	General Arrangement
01251-100-S07-E99-0005	R.4	MCT Frame Layout and schedule

4.1.1	Documentation check			
	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 4.1.		
	Acceptance criteria	All the documentation listed on chapter 4.1 Section 4 of the SAT procedure have to be present.		
	Notes			
	Executed	☒ Yes ☐ No	Result	☒ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

4.2 MCT FRAME

4.2	MCT Frame layout installation			
	Aim	Verify that the installation of the MCT layout		
	Pre-requisites	N.A.		
	Test description	The installation and the material must be in compliance with the following document: **01251-100-S07-E99-0005 MCT Frame Layout Arrangement**		
	Acceptance Criteria	Visual check and quantity check of the equipment		
	Notes	MCT SHALL BE INSTALLED AFTER CABLE COMING COMPLETION (laying)		
	Executed	☑ Yes ☐ No	Result	☐ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

Enppi	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	CEAR

CRUDE OIL TANK FARM
1251-100

EPM MODULE 030-EPM2

DRY TYPE TRANSFORMER

SAT

Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved
Notes:			EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.				
			Contract Number: 1251-100-500-16				
			Enppi Ref.: 01251-100-S07-P06-0003 R.1				
				Language: E		Total Pages 9	

INDEX

INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the EPM Electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied EPM

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

Personnel involved in the SAT.

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test): the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed [illegible]	ENPPI	[signature]	17/7/2021
M. Ibrahim	PPC	[signature]	17/7/2021
Cotti Cottini Fabio	CEAR	[signature]	17-07-21
	CEAR		

DESCRIPTION OF THE TESTS

Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages on the welds.

Dimensional Check will be performed to check if the dimensions of the component are in tolerances as per manufacturing drawings.

Surface Painting check will be performed to check the painting coating and final internal/external color.

Identification and Marking Check

Routine test certificate check

1. Documentation

Following a list of the relevant documents used to perform the SAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	EPM General Arrangements
01251-100-S07-E99-0007	R.4	Dry Type Transformer General Arrangement
01251-100-S07-K09-0005	R.3	EPM Transformer Data Sheet Supplier
01251-100-S07-K11-0005	R.4	EPM Filled in Purchaser Transformer Data Sheet
01251-100-S07-K11-0006	R.5	EPM Filled in Purchaser Bus Duct Data Sheet
01251-100-S07-E99-0006	R.4	LV Bus Duct General Arrangement
01251-100-S07-K12-0001	R.1	EPM Noise Data Sheet
01251-100-S07-E99-0009	R.4	Earthing system layout
01251-100-S07-E10-0001	R.5	LVSWG Single Line Diagram

1.1	Documentation check			
	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.		
	Acceptance criteria	All the documentation listed on chapter 1.1 Section 1 of the FAT procedure have to be present.		
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

2. Visual Check (without voltage supply)

2.2.1	Visual Check			
	Aim	Visual check of the good construction of the transformer and the transformer box		
	Pre-requisites	N.A.		
	Test description	Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages.		
	Acceptance criteria	Visual test and relevant photo		
	Notes	MV CABLE TERMINATION AND IS NOT CONNECTIONS		
	Executed	☒ Yes ☐ No	Result	☒ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

3. H.V. Cable Connection box

<table>
<tr><td rowspan="10">3.1</td><td colspan="4">HV Cable Connection box</td></tr>
<tr><td>Aim</td><td colspan="3">Verify the connection between transformer and HV box</td></tr>
<tr><td>Pre-requisites</td><td colspan="3">N.A.</td></tr>
<tr><td>Test description</td><td colspan="3">Visual connection marking check and tightening bolt control</td></tr>
<tr><td>Acceptance criteria</td><td colspan="3">The dimensions must be in compliance with the values reported on the following documents:
01251-100-S07-E99-000 7 Dry Type transformer General Arrangements</td></tr>
<tr><td>Marking phase check</td><td colspan="3"></td></tr>
<tr><td>Notes</td><td colspan="3">IMPORTANT NOTE
All operations concerning the H.V and MCT cable installation, cable connection ,6,6 kV power supply control, cable insulation and relevant tests are in charge of Enppi electrical commissioning department.
Before supply the transformer with 6,6 kV all test must be done and certified with a test report.</td></tr>
<tr><td>Executed</td><td>☑ Yes ☐ No</td><td>Result</td><td>☑ Positive ☐ Negative</td></tr>
<tr><td>Date</td><td>Supplier</td><td>Customer</td><td>Client</td></tr>
<tr><td>17-07-21</td><td>[signature]</td><td>[signature]</td><td>[signature]</td></tr>
</table>

4. Earthing Connection Check (without voltage supply)

4.1	Earthing Connection continuity check				
	Aim	Verify the installation of the earthing connection			
	Pre-requisites	N.A.			
	Test description	The installation and the material must be in compliance with the values reported on the following documents: **01251-100-S07-E99-0009 Earthing System Layout** **01251-100-S07-K009-0005 EPM Transformer Data Sheet Supplier**			
	Acceptance Criteria	The resistance measured shall be at least < Ω.			
	Instrument	Type: MEGGER Mod.: MIT 2002 S/N: / Test Certificate: /			
	Notes	Resistance value: < 1 Ω			
	Executed	☑ Yes ☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier	Customer		Client
	17-07-2[illegible]	[signature]	[signature]		[signature]

5. H.V. Transformer energization 6,6 kV from Enppi substation (power on)

The activity is in charge of Enppi commissioning department

<table>
<tr><td rowspan="10">5.1</td><td colspan="5">Power on transformer 6,6 kV</td></tr>
<tr><td>Aim</td><td colspan="4">Energize the EPM transformer from the substation Enppi</td></tr>
<tr><td>Pre-requisites</td><td colspan="4">All operations and safety rules must be in charge of Enppi</td></tr>
<tr><td>Test description</td><td colspan="4">Energizing operation from the substation</td></tr>
<tr><td>Acceptance Criteria</td><td colspan="4">Verify the voltage value in accordance with the 01251-100-S07-K009-0005 EPM Transformer t Data Sheet Supplier</td></tr>
<tr><td>Instrument</td><td colspan="4">Verify and check the voltage value in the substation room</td></tr>
<tr><td>Notes</td><td colspan="4">IMPORTANT NOTE
All operations concerning the H.V and MCT cable installation, cable connection ,6,6 kV power supply control, cable insulation and relevant tests are in charge of Enppi electrical commissioning department.
Before supply the transformer with 6,6 kV all test must be done and certified with a test report.
Report test check
Power supply ....kV 17-07-21
L1-L2: ....kV
L2-L3: ....kV 6.6KV IS NOT
L3-L1: ....kV AVAILABLE.
Insulation resistance test H.V cable
Resistance value: .... Ω AFTER POWER UP
Dielectric test H.V. cable PERFORMED TEST</td></tr>
<tr><td>Executed</td><td>☒ Yes ☐ No</td><td>Result</td><td colspan="2">☐ Positive ☐ Negative</td></tr>
<tr><td>Date</td><td>Supplier</td><td>Customer</td><td colspan="2">Client</td></tr>
<tr><td>17-07-21</td><td>[signature]</td><td>[signature]</td><td colspan="2">[signature]</td></tr>
</table>

Enppi	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	CEAR

CRUDE OIL TANK FARM
1251-100

EPM MODULE 030-EPM2

BUS DUCT

SAT
Commissioning and Site Integration Test Procedures

1	17/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved

Notes:	EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.	
	Contract Number: 1251-100-510-16	
	Enppi Ref.: 01251-100-S07-P06-0004 R.1	
	Language: E	Total Pages 9

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INTRODUCTION BUS DUCT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the EPM Electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied EPM

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

Personnel involved in the SAT.

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test): the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed [illegible]	ENPPI	[signature]	17/7/2024
M. Ibrahim	PPC	[signature]	17/7/2024
Com. Cotti Fabio	CEAR	[signature]	17-07-24
	CEAR		

DESCRIPTION OF THE TESTS

Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages on the welds.

Dimensional Check will be performed to check if the dimensions of the component are in tolerances as per manufacturing drawings.

Surface Painting check will be performed to check the painting coating and final internal/external color.

Identification and Marking Check will

Safety check insulation and dielectric test

1 Documentation.

Following a list of the relevant documents used to perform the FAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	EPM General Arrangements
01251-100-S07-E99-0006	R.4	LV Bus Duct General Arrangement
01251-100-S07-K09-0006	R.2	EPM Bus Duct Data Sheet Supplier
01251-100-S07-K11-0006	R.5	EPM Filled in Purchaser Bus Duct Data Sheet
01251-100-S07-E99-0007	R.4	Dry Type Transformer General Arrangement

1.1.1	Documentation check			
	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.		
	Acceptance criteria	All the documentation listed on chapter 1.1 Section 1 of the FAT procedure have to be present.		
	Notes			
	Executed	☒ Yes ☐ No	Result	☒ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

2. Visual Check

2.1	Visual Check				
	Aim	Visual check of the good construction of the Bus Duct			
	Pre-requisites	N.A.			
	Test description	Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages.			
	Acceptance criteria	Visual test and relevant photo			
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

3. Electrical Safety Check

3.1.1	Electrical Safety Check Insulation resistance measuring	
	Aim	Measure the insulation resistance between each phase and neutral against earth (with the remaining phases and neutral connected to the earth).
	Pre-requisites	N.A.
	Test description	The insulation resistance tests shall be carried out with all manually operated and latched type switching devices in the closed position and main fuses installed.
	Acceptance criteria	The insulation resistance measured shall be at least 10 MΩ.
	Instrument	Type: M.560HΩ Mod. MIT 42A-2 S/N : ✓ Test Certificate : ✓
	Test results	Value checked L1-E: 23.5.6Ω L2-E: 16.06Ω L3-E: 20.6.. Ω N-E : 16.06Ω
	Notes	
	Executed	☑ Yes ☐ No | Result ☑ Positive ☐ Negative
	Date	Supplier | Customer | Client
	17-07-21	[signature] | [signature] | [signature]

Enppi	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	CEAM

	Electrical Safety Check Dielectric test for bus bars	
3.1.2	**Aim**	Perform a dielectric test of the main circuits (400V ac) in accordance with CEI EN 61439-1 standard.
	Pre-requisites	N.A.
	Test description	Withstand voltage should be 2500 V ac for 1 minute. Dielectric tests shall be done on 10% of the number of similar units with a minimum of 2 units.
	Acceptance criteria	Please refer to chapter 10.9.2.4 of the CEI EN 61439-1 Standard.
	Instrument	Type: ...MOTANT... Mod.: ..MI2170. S/N : SM005.... Test Certificate : ....309-02...........
	Test results	L1 - G = 1,1 MA L2 - G = 1,1 MA L3 - G = 1,1 MA N - G = 1,1 MA
	Notes	

Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
Date	**Supplier**	**Customer**	**Client**
17-07-?	[signature]	[signature]	[signature]

3.1.3	Earthing Bus Duct continuity check			
	Aim	Verify t the installation of the earthing system of the Bus Duct		
	Pre-requisites	N.A.		
	Test description	The installation and the material must be in compliance with the values reported on the following documents: **01251-100-S07-E99-0009 Earthing System Layout** **01251-100-S07-K009-0006 EPM Bus Duct Data Sheet Supplier** **01251-100-S07-K011-0006 EPM Filled in Purchaser Bus Duct Data Sheet**		
	Acceptance Criteria	The resistance measured shall be at least < Ω.		
	Instrument	Type: ....MEGGER.... Mod.: M.I.T. 420-2 S/N : .../... Test Certificate : ....../......		
	Notes	Value checked:...< 1 Ω		
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

Enppi	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	CEAM

CRUDE OIL TANK FARM
1251-100

EPM MODULE 030-EPM2

LVSWG MCC

SAT

Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
0	20/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved

Notes:	EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.		
	Contract Number: 1251-100-16-7		
	Enppi Ref.: 01251-100-S07-P06-0002 R.1		
		Language: E	Total Pages 30

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INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the SAT Commissioning and Site Integration Test Procedure for the EPM Electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied EPM

Definition:

Supplier:	CEAR
Customer:	ENPPI
Client:	PPC

TESTING STRATEGY

The testing strategy includes the following two phases.

The Installation testing phase is developed to test the:

- Documentation;
- Mechanical installation;
- Electrical installation.

The Functioning testing phase is developed to test the functioning of the:

- Mechanical equipment's
- Electrical equipment's

Safety precaution

Before the beginning of the test brief safety induction will be done to all the people attending the test.

We will describe the company safety rules and the rules to be followed while attending the test.

Personnel involved in the SAT.

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test Procedures): the present people must sign next to their name.

CEAR can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Shaden	ENPPI	[signature]	17/7/2021
M. Ibrahim	PPC	[signature]	17/7/2021
Cotti Cottini Fabio	CEAR	[signature]	17-07-21
	CEAR		

DESCRIPTION OF THE TESTS

Visual test

General visual test will be performed to verify the good workmanship and correct installations

This document is the Site Acceptance Test for the Motor Control Center.

The document is the acceptance protocol concerning the hardware characteristics of the supplied MCC.

1.1. Testing Equipment to be used

Following a list of the instruments shall be available during the SAT by ENPPI:

Instrument	Model	Serial Number	Calibration expiry date
Electrical safety Tester for insulation and Dielectric tests	METRA HI1270	SM005	06-10-23
High voltage insulation Tester up to 1 kV DC (megger)	MEGGHER HT4102	/	/
Torque wrench	USA 6	A30710290/675	06-08-22
Multimeter	HT ITALIA HT1100	98600599	08-02-22
Ammeter Clamp	HT ITALIA HT9020	19073004	01-02-24

1.2. Documentation.

Following a list of the relevant documents used to perform the SAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	General Arrangement
01251-100-S07-E02-0001	R.4	LVSWG Overall Dimensions Panel Layout
01251-100-S07-E10-0001	R.5	LVSWG Single line diagram.
01251-100-S07-E99-0006	R.4	LV Bus Duct General Arrangement
01251-100-S07-K09-0003	R.4	EPM Main Equipment Supplier Data Sheet
01251-100-S07-E05-0002	R.5	EPM Internal Cable schedule

1.2.1. Documentation check

1.2.1	Documentation check				
	Aim	Check the presence of the project documentation.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the state of the documentation listed on chapter 4.1 of the SAT procedure.			
	Acceptance criteria	All the documentation listed on chapter 1.1 of the SAT procedure have to be present.			
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative	
	Date	Supplier	Customer	Client	
	17-07-2[illegible]	[signature]	[signature]	[signature]	

2. GENERAL CONSTRUCTION CHECK

2.1.1	Terminal block connections.				
	Aim	Check the terminal block connections (wiring and tightening).			
	Pre-requisites	N.A.			
	Test description	Spot visual inspection and tightening test (with a screw driver).			
	Acceptance criteria	The terminal block connections must be in compliance with the following documents: **01251-100-S07-E10-0001 LVSWG Single Line Diagram**			
	Instrument	Screw driver.			
	Notes				
	Executed	☒ Yes ☐ No	Result	☒ Positive ☐ Negative	
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

<table>
<tr><td rowspan="10">2.1.2</td><td colspan="2">LVSWG Cleanliness of the equipment</td></tr>
<tr><td>Aim</td><td>Check the cleanliness of the equipment.</td></tr>
<tr><td>Pre-requisites</td><td>Switchgear ready to be energized.</td></tr>
<tr><td>Test description</td><td>Visual inspection.</td></tr>
<tr><td>Acceptance criteria</td><td>The LV PMCC Switchgear is clean, dust has been removed and no tools are present in it.</td></tr>
<tr><td>Instrument</td><td>N.A.</td></tr>
<tr><td>Notes</td><td></td></tr>
<tr><td>Executed</td><td>☑ Yes ☐ No | Result ☑ Positive ☐ Negative</td></tr>
<tr><td>Date</td><td>Supplier | Customer | Client</td></tr>
<tr><td>17-07-21</td><td>[signature] | [signature] | [signature]</td></tr>
</table>

<table>
<tr><td rowspan="10">2.1.3</td><td colspan="4">Mechanical and electrical interlocks</td></tr>
<tr><td>Aim</td><td colspan="3">Check the functioning of the mechanical and electrical interlocks, door handle interlocks, key interlocks)</td></tr>
<tr><td>Pre-requisites</td><td colspan="3">N.A.</td></tr>
<tr><td>Test description</td><td colspan="3">Functional test of all the mechanical and electrical interlocks.</td></tr>
<tr><td>Acceptance criteria</td><td colspan="3">All the mechanical and electrical interlocks described on the following documents must be operative:
The LVSWG arrangement must be in compliance with the following documents:
01251-100-S07-E02-0001 LVSWG Overall Dimension Panel Layout.
01251-100-S07-E10-0001 LVSWG Single line Diagram</td></tr>
<tr><td>Instrument</td><td colspan="3">Operating handles, keys.</td></tr>
<tr><td>Notes</td><td colspan="3"></td></tr>
<tr><td>Executed</td><td>☑ Yes ☐ No</td><td>Result</td><td>☑ Positive ☐ Negative</td></tr>
<tr><td>Date</td><td>Supplier</td><td>Customer</td><td>Client</td></tr>
<tr><td>17-07-21</td><td>[signature]</td><td>[signature]</td><td>[signature]</td></tr>
</table>

3. EQUIPMENT CHECK

3.1	Visual check of power and auxiliary equipment like circuit breakers, switches, relays, contactors, lamps (model / rating).			
	Aim	Check the correct selection, installation and wiring of the circuit breakers and switches.		
	Pre-requisites	N.A.		
	Test description	Visual inspection of electrical components.		
	Acceptance criteria	The LVSWG circuit breakers and switches must be in compliance with the following document: **01251-100-S07-E10-0001 LVSWG Single line Diagram**		
	Instrument	N.A.		
	Notes	* The 230Vac/110VDC power supply is missing the 12V module that shall be provided by Cear		
	Executed	☒ Yes ☐ No	Result	☒ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

4. ELECTRICAL SAFETY CHECK

4.1.1	Insulation resistance test main circuits			
	Aim	A measurement of the resistance of the main circuit shall be made in accordance to IEC 61439-1 Standard.		
	Pre-requisites	N.A.		
	Test description	The measurement shall be made with DC voltage MegaOhmeter by measuring the resistance across the terminals of each phase.		
	Acceptance criteria	Resistance value bigger than 10 Mohm. The measured value of the resistance shall be listed in the test report, as well as the general conditions during the test (current, air temperature, etc.) for future comparison.		
	Instrument	Type: MCG6 MΩ Mod.: MIT420-2 S/N: / Test Certificate: /		
	Test results	L1-E = 2,41 GΩ L2-E = 2,07 GΩ L3-E = 2,30 GΩ N-E = 5,0 GΩ		
	Notes			
	Executed	☑ Yes ☐ No	**Result**	☑ Positive ☐ Negative
	Date	**Supplier**	**Customer**	**Client**
	17-07-21	[signature]	[signature]	[signature]

4.1.2	Dielectric test for main circuits.	
	Aim	Perform a dielectric test of the main circuits in accordance to IEC 61439- 1 Standard.
	Pre-requisites	N.A.
	Test description	Withstand voltage should be 2,5 kV ac for 5 seconds. The power-frequency voltage test shall be performed according to the IEC requirements. The test voltage shall be applied connecting each phase conductor of the main circuit in tum to the high-voltage terminal of the test supply, Dielectric tests shall be done on 10% of the number of similar units with a minimum of 2 units.
	Acceptance criteria	Please refer to chapter 10.9.2.4 of the CEI EN 61439-1 Standard.
	Instrument	Type: Metrel Mod.: MI 1170 S/N: SM 005 Test Certificate: 3004-01
	Test results	L1-E = 2,5 MA L2-E = 2,5 MA L3-E = 2,3 MA N-E = 2,8 MA
	Notes	

Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
Date	Supplier	Customer	Client
17-07-21	[signature]	[signature]	[signature]

4.1.3	Dielectric test for auxiliary circuits.			
	Aim	Perform a dielectric test of the auxiliary circuits in accordance with CEI EN 61439-1 standard.		
	Pre-requisites	N.A.		
	Test description	Withstand voltage should be 1500 V ac for 5 seconds. Dielectric tests shall be done on 10% of the number of similar units with a minimum of 2 units.		
	Acceptance criteria	Please refer to chapter 10.9.2.4 of the CEI EN 61439-1 Standard.		
	Instrument	Type: Metrel Mod.: MI 2170 S/N: SM005 Test Certificate: 3006-01		
	Test results	FEEDER AUX SUPPLY L = 0,7 mA W = 0,7 mA DOC AUX SUPPLY L = 0,2 mA W = 0,2 mA REF 615 AUX SUPPLY L = 0,1 mA W = 0,1 mA AUX SUPPLY 230V L = 12 mA W = 15 mA AUX SUPPLY 110Vdc + = 0,1 mA − = 0,1 mA		
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-24	[signature]	[signature]	[signature]

5. POWER SUPPLY CHECK

5.1.1	Main circuits Power supply			
	Aim	Check the main circuits power supply.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the value of the main power supply voltage.		
	Acceptance criteria	The main circuits power supply voltage should be 400V 3P+N 50Hz.		
	Instrument	Type: HT ITALIA Mod.: HT1100 S/N: 98600599 Test Certificate: 7544		
	Measured voltage	Value: 400V	Frequency	50HZ
	Notes	//		
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

5.1.2	Auxiliary circuits Power supply			
	Aim	Check the auxiliary circuits power supply.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the value of the auxiliary power supply voltage.		
	Acceptance criteria	The auxiliary circuits power supply voltage should be 230V 1P+N 50Hz.		
	Instrument	Type: HT 1TSU9 Mod.: HT8100 S/N: 98600599 Test Certificate: 7544		
	Measured voltage	**Value** 230V	**Frequency** 50 HZ	
	Notes			
	Executed	☑ Yes ☐ No	**Result**	☑ Positive ☐ Negative
	Date	**Supplier**	**Customer**	**Client**
	17-07-??	[signature]	[signature]	[signature]

<table>
<tr><td rowspan="10">5.1.3</td><td colspan="4">Heaters and Internal light</td></tr>
<tr><td>Aim</td><td colspan="3">Check the heaters power supply.</td></tr>
<tr><td>Pre-requisites</td><td colspan="3">Low voltage auxiliary power supply 230 Vac control circuits interconnected.</td></tr>
<tr><td>Test description</td><td colspan="3">N.A.</td></tr>
<tr><td>Acceptance criteria</td><td colspan="3">The heaters power supply voltage should be 230V 1P+N 50Hz.</td></tr>
<tr><td>Instrument</td><td colspan="3">Type: HT IT J117
Mod.: HT 8100 S/N : 98.600.599
Test Certificate: 7544</td></tr>
<tr><td>Measured voltage</td><td>Value 230 V</td><td>Frequency</td><td>50HZ</td></tr>
<tr><td>Notes</td><td colspan="3"></td></tr>
<tr><td>Executed</td><td>☑ Yes ☐ No</td><td>Result</td><td>☑ Positive ☐ Negative</td></tr>
<tr><td>Date
17-07-21</td><td>Supplier</td><td>Customer</td><td>Client</td></tr>
</table>

6. FUNCTIONAL TESTING.

6.1. Electrical equipment.

<table>
<tr><td rowspan="8">6.1.1</td><td colspan="4">LVSWG power sections operating conditions.</td></tr>
<tr><td>Aim</td><td colspan="3">Operation tests shall be made to ensure that the switching devices and removable parts and mechanical interlocks work properly.</td></tr>
<tr><td>Pre-requisites</td><td colspan="3">N.A.</td></tr>
<tr><td>Test description</td><td colspan="3">These tests shall be performed without voltage on or current in the main circuits.</td></tr>
<tr><td>Acceptance criteria</td><td colspan="3">It shall be verified that:
– the switching devices open and close correctly
– each removable part can be inserted and removed correctly;
– all interlocks work properly.</td></tr>
<tr><td>Instrument</td><td colspan="3"></td></tr>
<tr><td>Notes</td><td colspan="3"></td></tr>
<tr><td>Executed</td><td>☑ Yes ☐ No</td><td>Result</td><td>☑ Positive ☐ Negative</td></tr>
<tr><td></td><td>Date</td><td>Supplier</td><td>Customer</td><td>Client</td></tr>
<tr><td></td><td>17-07-2</td><td>[signature]</td><td>[signature]</td><td>[signature]</td></tr>
</table>

<table>
<tr><td rowspan="10">6.1.2</td><td colspan="4">LVSWG withdrawable units operating conditions.</td></tr>
<tr><td>Aim</td><td colspan="3">Check the functioning of the LVSWG withdrawable motor starters</td></tr>
<tr><td>Pre-requisites</td><td colspan="3">N.A.</td></tr>
<tr><td>Test description</td><td colspan="3">Check the mechanical and electrical functioning of the withdrawable units:
• TEST mode;
• REMOTE mode;</td></tr>
<tr><td>Acceptance criteria</td><td colspan="3">The mechanical and electrical functioning of the withdrawable units must be in compliance with the following document:
01251-100-S07-E10-0001 LVSWG Single line Diagram</td></tr>
<tr><td>Checked units</td><td colspan="3"></td></tr>
<tr><td>Notes</td><td colspan="3"></td></tr>
<tr><td>Executed</td><td>☑ Yes ☐ No</td><td>Result</td><td>☑ Positive ☐ Negative</td></tr>
<tr><td>Date</td><td>Supplier</td><td>Customer</td><td>Client</td></tr>
<tr><td>17-07-21</td><td>[signature]</td><td>[signature]</td><td>[signature]</td></tr>
</table>

6.1.3	LVSWG withdrawable units operating conditions.			
	Aim	Check the functioning of the LVSWG withdrawable feeders		
	Pre-requisites	N.A.		
	Test description	Check the mechanical and electrical functioning of the withdrawable units:		
	Acceptance criteria	The mechanical and electrical functioning of the withdrawable units must be in compliance with the following document: **01251-100-S07-E10-0001 LVSWG Single line Diagram**		
	Checked units			
	Notes			
	Executed	☑ Yes ☐ No	**Result**	☑ Positive ☐ Negative
	Date	**Supplier**	**Customer**	**Client**
	17-07-21	[signature]	[signature]	[signature]

<table>
<tr><td rowspan="10">6.1.4</td><td colspan="2">Protection relays functional test.</td></tr>
<tr><td>Aim</td><td>Check and test the protective relays by current injection on primary and secondary circuits.</td></tr>
<tr><td>Pre-requisites</td><td>N.A.</td></tr>
<tr><td>Test description</td><td>Inject the test current into the primary and secondary circuits of the Current Transformers and check the intervention of the relevant protection relays.
Protection relays to be checked are the ones of the:
• LVSWWG Incoming sections;
• LVSWG withdrawable units.</td></tr>
<tr><td>Acceptance criteria</td><td>The protection relays intervention must be in compliance with the following document:
01251-100-S07-E10-0001 LVSWG Single line Diagram</td></tr>
<tr><td>Protection functions Tested</td><td>FAT REPORT</td></tr>
<tr><td>Notes</td><td></td></tr>
<tr><td>Executed</td><td>☑ Yes ☐ No | Result ☑ Positive ☐ Negative</td></tr>
<tr><td>Date</td><td>Supplier | Customer | Client</td></tr>
<tr><td>17-07-21</td><td>[signature] | [signature] | [signature]</td></tr>
</table>

6.1.5	Inter-changeability of electrically identical components.			
	Aim	Check the inter-changeability of electrically identical components.		
	Pre-requisites	N.A.		
	Test description	Change the position/assembling of electrically identical components.		
	Acceptance criteria	The system LVSWG must continue to work properly.		
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

7. COMMISSIONING and START-UP PROCEDURES

7.1. Preliminary operations.

Before starting-up the electrical and instrumentation commissioning of the M.C.C. all the erection activity have to be completed and all the followings point should be checked and confirmed.

7.1.1 Mechanical assembling check list.

	Check equipment' alignment	☑
	Check all bolts fixing	☑

7.1.2 Electrical connection check list.

	Check cabling connection	☑
	Check the insulation resistance of the outgoing cabling before energising the loads	☑

7.1.3 Checks without power supply.

Before energising the system, all the followings point should be checked and confirmed.

	Check the grounding connection of the MCC	☑
	Check and set all the electrical protection as per the wiring diagram	☑

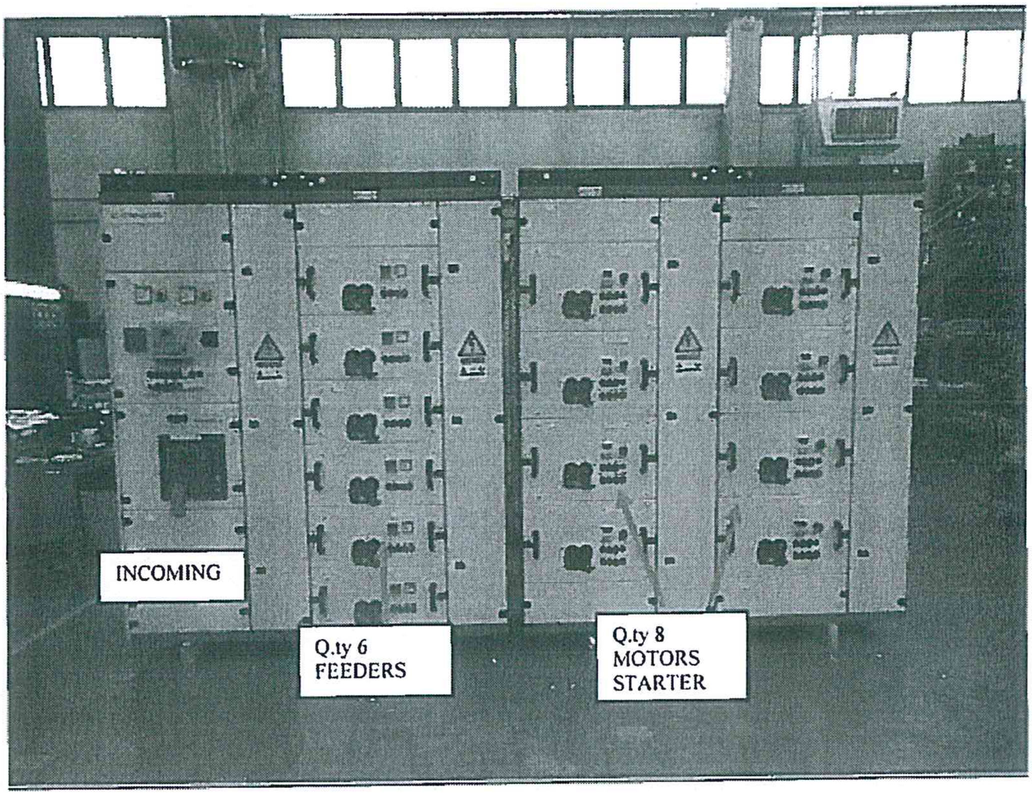
7.2. COMMISSIONING

Before starting the MCC energising sequence, all the Incoming Line Circuit breaker, the drawers main circuit breakers and the miniature circuit breakers must be previously opened.

MCC Power section commissioning/operating.

The MCC is supplied by one incoming line from transformer Tag 0XY-EPM(Z)-TR-1 400V 3ph +P + N (see fig. 1.1).

Fig. 1.1 – MCC Incoming Lines



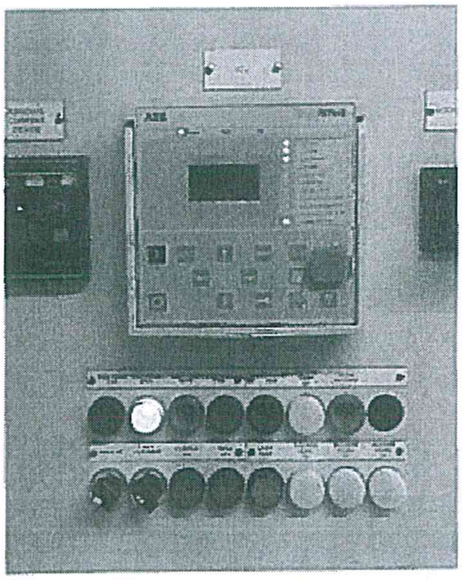
To start with the commissioning operation the LVSWG MMC shall be fed from the transformer 400 V 50 Hz 3P +N for power circuits and fed from the UPD panel for the auxiliary circuits 230V 50 Hz 1P+N.

7.3. INCOMING LINE SWITCH FUNCTION (column 1)

7.3.1. NORMAL OPERATION

MAIN INCOMING SWTCH ON- OFF COMMAND

The main switch can be commanded in the following mode by the selector switch and operators installed on the auxiliary command panel of the incoming column of the MCC. (see picture below)



Selector switch 30SA1 "Manual-Automatic" function
-Manual position defines the switch command by Local command from the MCC
-Automatic position defines the switch command by the control relay REF 615.
Selector switch 30SA2 "Local-Remote" function
-Local position defines the command switch by the start/stop pushbutton installed on the command panel
-Remote position defines the command switch by the command from DCS Enppi

Local Operation sequences:

-Turn the selector switch 30SA1 in Manual position
-Turn the selector switch 30SA2 in Local position
-Press the pushbutton 30SB1 for "Close" command
-Press the pushbutton 30SB2 for "Open" command

Remote Operation sequences:
-Turn the selector switch 30SA1 in Automatic position
-Turn the selector switch 30SA2 in Remote position
-The command "Closed" from DCS command the closing of switch
-The command "Open" from DCS command the opening switch

Automatic Operation sequences:

-Turn the selector switch 30SA1 in Automatic position
-The "Close" command is generated from the relay REF 615
-The "Open" command is generated from the relay REF 615

7.3.2. POWER SUPPLY LOSS

The main incoming switch shall open due to under voltage protection (F27) controlled by protection relay REF615 (27A1)
The main switch of the feeder drawer shall remain closed
The main switch of the DOL drawer shall remain closed, motor contactor contactors shall open if under voltage continue more than 4.5 seconds.

7.3.3. POWER RESTORATION

The main incoming switch shall be closed in one of the way indicated in the point 1 Local, Remote or Automatic

If the motor contactor open, due to power loss for more than 4.5 seconds,) can be restarted manually from the local control station (Local Start/Stop) or from the DCS command (Start/Stop contact).
See point 8.3 DOL drawer

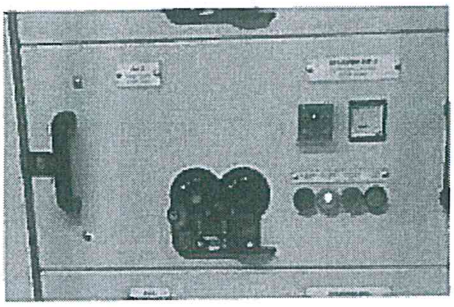
7.4. LVSWG MCC Columns

7.4.1. Drawer feeder commissioning/operating (column 2)

The drawer feeder column 2 is equipped with:
- Q.ty 5 Type F 4 poles drawers for feeder 100A
- Q.ty 1 Type F 3 poles drawers for feeder 63A

Front Drawer feeder type F (3 & 4 poles) see below picture

- **PA80A** Ammeter;
- **84SB1**, Lamp Test blue push-button
- **84HL1**, Green signal lamps (Circuit breaker open)
- **84HL2**, Red signal lamps (Circuit breaker closed)
- **84HL3**, Yellow signal lamps (Circuit breaker tripped on fault)
- **82A1**, Residual current monitor



The feeders are connected according to the doc. 01251-100-S07-E10-0001

Test sequence

Check that the MCC in energized	☑
Insert the drawer	☑

✓Check the correct function of the signal lamps by pushing the: ✓**84SB1** Lamp test push button ✓**84HL1**, Green signal lamps (Circuit breaker open) ✓**84HL2**, Red signal lamps (Circuit breaker closed) ✓**84HL3**, Yellow signal lamps (Circuit breaker tripped)	☑ ☑ ☑ ☑
✓**82A1**, Residual current monitoring check	☑

Service sequence

Insert the key; press and rotate 180° clockwise to "I" position to insert the incoming power connector switch	
Remove the key from the left side rotary handle	
Insert the key in the right side rotary handle, press and rotate 90° clockwise to "I" position; the main incoming circuit breaker is closed and the feeder is now operating	

See attachment Lafer ME_CUB ITA ENG manual drawer operation

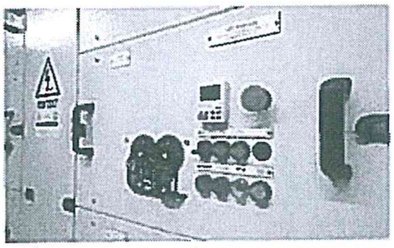
7.4.2. DOL drawer commissioning/operating (column 3 and 4)

The DOL drawer column 3 and 4 is equipped with

- Q.ty 4 Type M 3 poles drawers DOL motor starter > 7,5 kW and <75kW

<u>Front DOL Drawer type M</u> (3 poles) Motor starter > 7,5 Kw and <75kW see below picture

- **53SA1**, TEST-OFF-REMOTE black selector switch with 3 maintained position.
- **53SB2**, STOP red push-button
- **53SB3**, START green push-button
- **55SB1**, Lamp Test blue push-button
- **55HL1**, Red signal lamps (RUN - MOTOR ON)
- **55HL2**, Green signal lamps (STOP- MOTOR OFF)
- **55HL3**, Yellow signal lamps (MOTOR FAULT)
- **53SB1**, Mushroom Emergency stop push button



Motor starter drawer are connecting in according the doc. 01251-100-S07-E10-0001

DOL motor starter is equipped with:

- **QF50.1**, LV moulded case circuit breaker
- **UMC100.3 UC** controller with UMC panel LCD DISPLAY

Test sequence

Check that the MCC in energized	☑
Insert the drawer	☑

✓Check the correct function of the signal lamps by pushing the: ✓**55SB1** Lamp test push button ✓**55HL1**, Green signal lamps (Circuit breaker open) ✓**55HL2**, Red signal lamps (Circuit breaker closed) ✓**55HL3**, Yellow signal lamps (Circuit breaker tripped)	☑ ☑ ☑ ☑

Turn in "**TEST**" position the selector switch **53SA1** to TEST the control circuit UMC100.3 (contactor closed →**no power on the outgoing clamps**) ✓Check the status of the UMC100.3 ✓**55HL2**, green lamp "ON" means contactor open (Motor off) ✓**55HL1**, red lamp "ON" means contactor closed (Motor on) ✓**55HL3**, yellow lamp of reset pushbutton "ON" means main circuit breaker TRIP or UMC100.3 fault	☑ ☑ ☑ ☑

By the push button installed on the front of the drawer is possible to command the motor contactor: ✓**53SB1** Mushroom Stop pushbutton (emergency Stop) ✓**53SB3** Start command ✓**55HL1**, red lamp "ON" means contactor closed (Motor on) ✓**53SB2** Stop command ✓**55HL2**, green lamp "ON" means contactor open (Motor off) ✓**55HL3**, yellow lamp of reset pushbutton "ON" means main circuit breaker TRIP or UMC100.3 fault	☑ ☑ ☑ ☑ ☑

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EPM MODULE 030-EPM2

DP-1 Indoor Distribution Panel

SAT

Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
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	Contract Number: 1251-100-16-7	
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	Language: E	Total Pages. 11

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INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the Indoor DP-1 Distribution Panel of the EPM electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied DP-1 Panel

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

1.1 Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and SAT Integration Test) the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Abdeem	ENPPI	[signature]	17/7/2021
M. Ibrahim	PPC	[signature]	17/7/2021
Cotti Cotti Fabio	CEAR	[signature]	17-07-21
	CEAR		

1.2 DOCUMENTATION

Following a list of the relevant documents used to perform the FAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	General Arrangement
01251-100-S07-E02-0002	R.4	Indoor Light Distribution Panel Overall Dimensions Panel Layout
01251-100-S07-E10-0002	R.4	Indoor Panel Single & Wiring diagram.
01251-100-S07-K11-0007	R.4	EPM Filled in DP-1 Indoor Distribution Panel Data Sheet
01251-100-S07-E05-0002	R.5	EPM Internal Cable schedule

2. TESTING STRATEGY

The testing strategy includes the following two phases.

The **Installation** testing phase is developed to test the:

- Documentation;
- Mechanical installation;
- Electrical installation.

The **Functioning** testing phase is developed to test the functioning of the:

- Electrical equipment;

3. INSTALLATION TESTING

3.1 Documentation check.

3.1	Documentation check.				
	Aim	Check the presence of the project documentation.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.			
	Acceptance criteria	All the documentation listed on chapter 1.2 of the FAT procedure have to be present.			
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

3.2 INSTALLATION CHECK

3.2.1	DP-1 Indoor Distribution Panel				
	Aim	Check the DP-1 identification label.			
	Pre-requisites	N.A.			
	Test description	Visual inspection.			
	Acceptance criteria	The DP-1 identification label must be in compliance with the following documents: **01251-100-S07-E10-0002 Indoor Panel Single Line Diagram** **01251-100-S07-E02-0002 Indoor Overall Dimension Panel Layout**			
	Instrument	N.A.			
	Notes				
	Executed	☑ Yes ☐ No	**Result**	☑ Positive	☐ Negative
	Date	**Supplier**	**Customer**	**Client**	
	17-07-21	[signature]	[signature]	[signature]	

3.2.2	DP-1 Indoor Distribution Panel Front lay-out				
	Aim	Check the front DP-1 layout.			
	Pre-requisites	N.A.			
	Test description	Visual inspection.			
	Acceptance criteria	The front layout must be in compliance with the following documents: **01251-100-S07-E10-0002 Indoor Panel Single Line Diagram** **01251-100-S07-E02-0002 Indoor Overall Dimension Panel Layout.**			
	Instrument	N.A.			
	Notes				
	Executed	☑ Yes ☐ No	**Result**	☑ Positive	☐ Negative
	Date	**Supplier**	**Customer**	**Client**	
	17-07-21	[signature]	[signature]	[signature]	

3.2.3	Mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc.			
	Aim	Check the functioning of the mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc..		
	Pre-requisites	N.A.		
	Test description	Functional test of all the mechanical and electrical interlocks.		
	Acceptance criteria	All the mechanical and electrical interlocks described on the following documents must be operative: The DP-1arrangement must be in compliance with the following documents: **01251-100-S07-E10-0004 UPS Single Line Diagram** **01251-100-S07-E02-0002 Indoor Overall Dimension Panel Layout**		
	Instrument	N.A.		
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-?1	[signature]	[signature]	

3.3 POWER SUPPLY CHECK

3.3.1	Main circuits Power supply			
	Aim	Check the main circuits power supply.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the value of the main power supply voltage.		
	Acceptance criteria	The main circuits power supply voltage should be 400V 3P+N 50Hz.		
	Instrument	Type: HT ITSU7 Mod.: HT 110 S/N: 33600589 Test Certificate: 7564		
	Measured voltage	Value: 400 V	Frequency	50HZ
	Notes			
	Executed	☒ Yes ☐ No	Result	☒ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

3.3.2	Auxiliary circuits Power supply			
	Aim	Check the auxiliary circuits power supply.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the value of the auxiliary power supply voltage.		
	Acceptance criteria	The auxiliary circuits power supply voltage should be 230V 1P+N 50Hz.		
	Instrument	Type: HT ITSU7 Mod.: HT 110 S/N: 33600599 Test Certificate: 7564		
	Measured voltage	Value: 230V	Frequency	50HZ
	Notes			
	Executed	☒ Yes ☐ No	Result	☒ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

4. FUNCTIONAL TESTING.

4.1 Electrical equipment.

	DP-1 operating conditions.			
	Aim	Check the functioning of the DP-1		
	Pre-requisites	N.A.		
	Test description	Check the circuit breaker, signal lamps and verify the output distribution		
4.1	**Acceptance criteria**	The electrical functioning of the DP-1 must be in compliance with the following document: **01251-100-S07-E10-0002 Indoor Panel Single & Wiring Diagram**		
	Notes			
	Executed	☑ Yes ☐ No	**Result**	☑ Positive ☐ Negative
	Date	**Supplier**	**Customer**	**Client**
	17-07-2[illegible]	[signature]	[signature]	[signature]

5 COMMISSIONING AND START-UP PROCEDURES DP 1 INDOOR PANEL

5.1 Preliminary operation

Before starting-up the electrical and instrumentation commissioning of Indoor Power Distribution Panel all the lighting circuit will be terminated and all the followings point should be checked and confirmed:
The indoor provide supply the internal EPM circuit and 230V 50 Hz internal and external socket.
Each circuit is controlled by the relevant circuit breaker.

5.1.1. Mechanical assembling

	Check equipment's alignment	☑
	Check all bolts fixing	☑

5.1.2 Electrical / Instrument connecting

	Check cabling connection	☑
	Check insulated test of cabling system before energizing on the outgoing	☑

After confirmation, the distribution Panel is ready for electrical test without voltage supply
Field test check
Check and Test without voltage supply

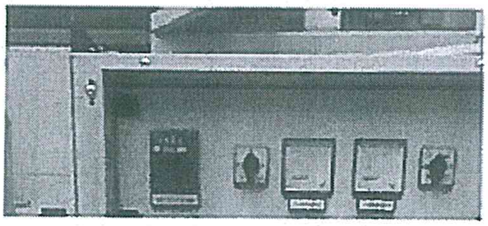
Before energising the system, all the followings point should be checked and confirmed:

	Check earthing system connection from the external grounding system to the Indoor Power Distribution Panel ground bar (PE bar).	☑
	Check and/or set all electrical protection as per the wiring diagram	☑

After confirmation, the Indoor Power Distribution Panel is ready for electrical and instrument test with power supply.

5.1.3 Check and Test with Voltage supply

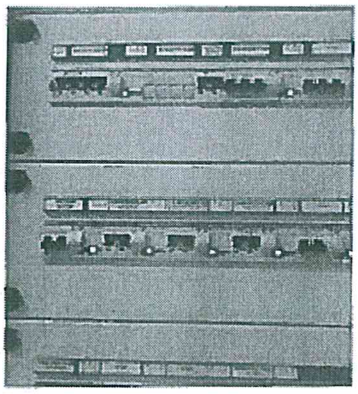
Before energizing the indoor panel, all breaker must be open.
The indoor panel DP 1 is provided with the following measuring control (see picture):



-Main circuit breaker
-Ammeter and relevant ammeter switch
-Voltmeter and relevant voltmeter switch

5.1.4 Test the circuit one by one and not at the same time in order to check correctly

Each lighting circuit is controlled by the relevant switch breaker, each breaker is equipped with 3 signal lamps green "OFF", red "ON", yellow "FAULT".



The next description includes the action for each section step by step.
For the function of each circuit breaker (Refer to the 01251-100-S07-E10-0002-Indoor Panel Single Line and Wiring Diagram)

The operation is the following:

Check the voltage supply on the 3 P+N on the Voltmeter PV1 by the voltmeter switch SV 1 close the fuse switch QU1.1
Check by the Lamp Test SB1 the correct function of the signal lamp Close the breaker QF1.1 and supply the aux. transformer for signal lamp.
By the signal lamp HL1.1/2.1/3.1 check the status of main circuit breaker
Close the main breaker QF1 to supply all circuit breaker Closed the breaker QF0 for pilot circuit emergency light
Close the Circuit Breaker QF2 to QF12 step by step to supply circuit and check the output voltage by voltmeter. For Each circuit breaker are provided the following signal lamp: -Red Lamp Circuit breaker close -Green Lamp Circuit breaker open -Yellow Lamp Fault

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EPM MODULE 030-EPM2

DP-2 Outdoor Distribution Panel

SAT

Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
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			Enppi Ref.: 01251-100-S07-P06-0008 R.1				
				Language: E		Total Pages: 13	

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INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the Outdoor DP-2 Distribution Panel of the EPM electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied DP-2 Panel

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

1.1 Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test Procedures): the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Nadeem	ENPPI	[signature]	17/7/2021
M. Ibrahim	PPC	[signature]	17/7/2021
Com. Cotton FABIO	CEAR	[signature]	17-07-21
	CEAR		

1.2 DOCUMENTATION

Following a list of the relevant documents used to perform the FAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001		General Arrangement
01251-100-S07-E02-0003		Outdoor Light Distribution Panel Overall Dimensions Panel Layout
01251-100-S07-E10-0003		Outdoor Panel Single & Wiring diagram.
01251-100-S07-K11-0008		EPM Filled in DP-2 Outdoor Distribution Panel Data Sheet
01251-100-S07-E05-0002		EPM Internal Cable schedule

2. TESTING STRATEGY

The testing strategy includes the following two phases.

The **Installation** testing phase is developed to test the:

- Documentation;
- Mechanical installation;
- Electrical installation.

The **Functioning** testing phase is developed to test the functioning of the:

- Electrical equipment

3. INSTALLATION TESTING.

3.1 Documentation check.

3.1	Documentation check.					
	Aim	Check the presence of the project documentation.				
	Pre-requisites	N.A.				
	Test description	Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.				
	Acceptance criteria	All the documentation listed on chapter 1.2 of the FAT procedure have to be present.				
	Notes					
	Executed	☑ Yes	☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier		Customer	Client	
	17-07-21	[signature]		[signature]	[signature]	

3.2 General construction Check

3.2.1	Terminal block connections.				
	Aim	Check the terminal block connections (wiring and tightening).			
	Pre-requisites	N.A.			
	Test description	Visual inspection and tightening test (with a screw driver).			
	Acceptance criteria	The terminal block connections must be in compliance with the following documents: **01251-100-S07-E10-0003 Outdoor Panel Single & Wiring Diagram** **01251-100-S07-E02-0003 Outdoor DP-2 Overall Dimension Panel Layout**			
	Instrument	Screw driver.			
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

3.2.2	Earthing connections.				
	Aim	Check the earthing connections (wiring and tightening).			
	Pre-requisites	N.A.			
	Test description	Visual inspection and tightening test (with a screw driver or a wrench).			
	Acceptance criteria	The earthing connections must be in compliance with the following documents: **01251-100-S07-E10-0003 Outdoor Panel Single & Wiring Diagram** **01251-100-S07-E99-0009 Earthing System Internal External Layout**			
	Instrument	Screw driver, Wrench.			
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

3.2.3	Electrical equipment labels.			
	Aim	Check the equipment labels.		
	Pre-requisites	N.A.		
	Test description	Visual inspection.		
	Acceptance criteria	The electrical equipment labels must be in compliance with the following document: **01251-100-S07-E02-0002 Indoor Overall Dimension Panel Layout**		
	Instrument	N.A.		
	Notes			
	Executed	☑ Yes ☐ No	Result ☑ Positive	☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

3.2.4	DP-2 Cleanliness of the equipment			
	Aim	Check the cleanliness of the equipment.		
	Pre-requisites	N.A.		
	Test description	Visual inspection.		
	Acceptance criteria			
	Instrument	N.A.		
	Notes			
	Executed	☑ Yes ☐ No	Result ☑ Positive	☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

3.2.5	Mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc.			
	Aim	Check the functioning of the mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc..		
	Pre-requisites	N.A.		
	Test description	Functional test of all the mechanical and electrical interlocks.		
	Acceptance criteria	All the mechanical and electrical interlocks described on the following documents must be operative: The DP-2 arrangement must be in compliance with the following documents: **01251-100-S07-E10-0003 Outdoor Panel Single & Wiring Diagram** **01251-100-S07-E02-0003 Outdoor DP-2 Overall Dimension Panel Layout**		
	Instrument	N.A.		
	Notes			
	Executed	☑ Yes ☐ No	**Result**	☑ Positive ☐ Negative
	Date	**Supplier**	**Customer**	**Client**
	17-07-2(	[signature]	[signature]	[signature]

3.3 Power supply Check

3.3.1	Main circuits Power supply			
	Aim	Check the main circuits power supply.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the value of the main power supply voltage.		
	Acceptance criteria	The main circuits power supply voltage should be 400V 3P+N 50Hz.		
	Instrument	Type: HT ITALIA Mod.: HT1100 S/N: 98600599 Test Certificate: 7564		
	Measured voltage	Value: 400V	Frequency	50HZ
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

3.3.2	Auxiliary circuits Power supply			
	Aim	Check the auxiliary circuits power supply.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the value of the auxiliary power supply voltage.		
	Acceptance criteria	The auxiliary circuits power supply voltage should be 230V 1P+N 50Hz.		
	Instrument	Type: HT ITALIA Mod.: HT1100 S/N: 98600599 Test Certificate: 7564		
	Measured voltage	Value: 230V	Frequency	50HZ
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

4. FUNCTIONAL TESTING.

4.1 Electrical equipment.

<table>
<tr><td rowspan="8">4.1.</td><td colspan="4">DP-2 operating conditions.</td></tr>
<tr><td>Aim</td><td colspan="3">Check the functioning of the DP-2</td></tr>
<tr><td>Pre-requisites</td><td colspan="3">N.A.</td></tr>
<tr><td>Test description</td><td colspan="3">Check the circuit breaker, signal lamps and verify the output distribution.
Check the operation of photocell and relevant contactor.</td></tr>
<tr><td>Acceptance criteria</td><td colspan="3">The electrical functioning of the DP-2 must be in compliance with the following document:
01251-100-S07-E10-0003 Outdoor Panel Single & Wiring Diagram</td></tr>
<tr><td>Notes</td><td colspan="3"></td></tr>
<tr><td>Executed</td><td>☑ Yes ☐ No</td><td>Result</td><td>☑ Positive ☐ Negative</td></tr>
<tr><td>Date
17-07-21</td><td>Supplier
[signature]</td><td>Customer
[signature]</td><td>Client
[signature]</td></tr>
</table>

5 COMMISSIONING AND START-UP PROCEDURES DP 2 OUTDOOR PANEL

5.1 Preliminary operation

Before starting-up the electrical and instrumentation commissioning of Outdoor Power Distribution Panel all the lighting circuit will be terminated and all the followings point should be checked and confirmed:
The outdoor panel provide supply the perimetral and roof top EPM lighting circuits and all area external lighting system installed by Enppi.
Each circuit is controlled by the relevant circuit breaker.

5.1.1. Mechanical assembling

	Check equipment's alignment	
	Check all bolts fixing	

5.1.2 Electrical / Instrument connecting

	Check cabling connection	
	Check insulated test of cabling system before energizing on the outgoing	

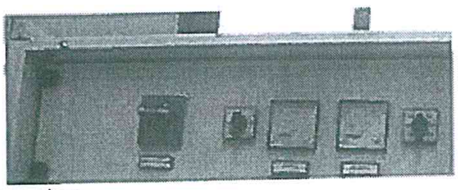
After confirmation, the distribution Panel is ready for electrical test without voltage supply
Field test check
Check and Test without voltage supply
Before energising the system, all the followings point should be checked and confirmed:

	Check earthing system connection from the external grounding system to the Indoor Power Distribution Panel ground bar (PE bar).	
	Check and/or set all electrical protection as per the wiring diagram	

After confirmation, the Indoor Power Distribution Panel is ready for electrical and instrument test with power supply.

5.1.3 Check and Test with Voltage supply

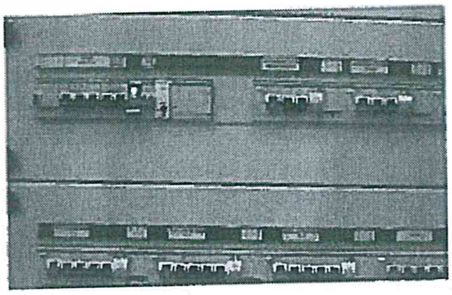
Before energizing the indoor panel, all breaker must be open.
The indoor panel DP 2 is provided with the following measuring control (see picture):

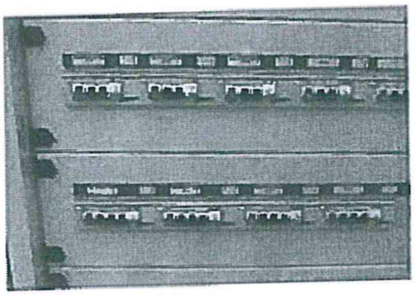


-Main circuit breaker
-Ammeter and relevant ammeter switch
-Voltmeter and relevant voltmeter switch

5.1.4 Test the circuit one by one and not at the same time in order to check correctly

Each lighting circuit is controlled by the relevant switch breaker, each breaker is equipped with 3 signal lamps green "OFF", red "ON", yellow "FAULT".

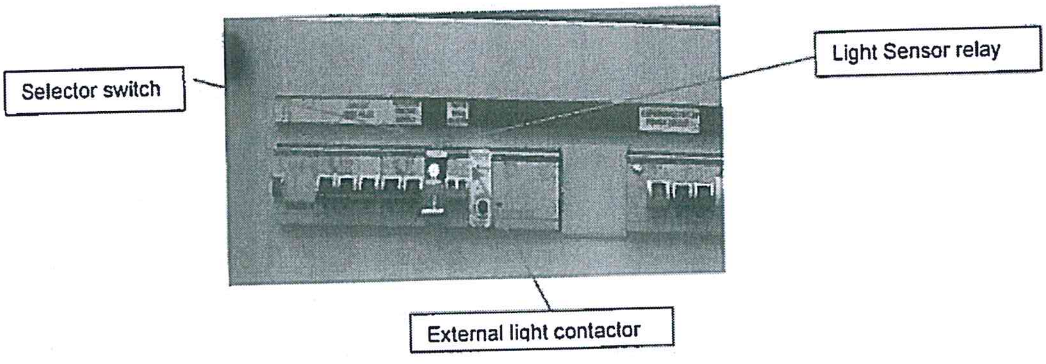




The outdoor panel is provided with the section for outdoor lighting system controlled by light sensor installed under the roof top.

This section is equipped with:
-Selector switch 3 position "Man.-0-Auto"
-Light sensor relay
In "Auto" position the lighting system is controlled by an external sensor that provide to command the contactor for external lighting system based on the daylight.

In "Manual" position the lighting system is always on, the sensor is not operated



The next description includes the action for each section step by step.
For the function of each circuit breaker (Refer to the 01251-100-S07-E10-0003 Outdoor Panel Single Line and Wiring Diagram)
The operation is the following:

Check the voltage supply on the 3 P+N on the Voltmeter PV1 by the voltmeter switch SV 1 close the fuse switch QU1.1
Check by the Lamp Test SB1 the correct function of the signal lamp Close the breaker QF 1.1 and supply the aux. transformer for signal lamp.
Close the Main Circuit breaker QF1
By the signal lamp HL1.1/2.1/3.1 check the status of main circuit breaker
Closed the breaker QF 0 for pilot circuit emergency light
Close the Circuit Breaker QF 3 QF 4 QF 5 step by step to supply all circuit convenience outlet sockets and check the output voltage by voltmeter. For Each circuit breaker are provided the following signal lamp: -Red Lamp Circuit breaker close -Green Lamp Circuit breaker open -Yellow Lamp Fault
Close the Circuit Breaker QF6 to QF13 step by step to supply all circuit and check the output voltage by voltmeter. For Each circuit breaker are provided the following signal lamp: -Red Lamp Circuit breaker close -Green Lamp Circuit breaker open -Yellow Lamp Fault

Enppi	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	CEAT

CRUDE OIL TANK FARM 1251-100

EPM MODULE 030-EPM2

UPDP Distribution Panel

SAT

Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved

Notes:	EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.	
	Contract Number: 1251-100-510-16	
	Enppi Ref.: 01251-100-S07-P06-0009 R.1	
	Language: E	Total Pages: 12

INDEX

INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the UPS Distribution Panel of the EPM electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied UPS Panel

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

1.1 Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test Procedures):the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed [illegible]	ENPPI	[signature]	17/7/2021
M. Ibrahim	PPC	[signature]	17/7/2021
COTTI COTTI FABIO	CEAR	[signature]	17-07-21
	CEAR		

1.2 DOCUMENTATION

Following a list of the relevant documents used to perform the FAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	General Arrangement
01251-100-S07-E02-0004	R.4	UPS Panel Overall Dimensions Panel Layout
01251-100-S07-E10-0004	R.4	UPS Panel Single & Wiring diagram.
01251-100-S07-K11-0009	R.2	EPM Filled UPS Distribution Panel Data Sheet
01251-100-S07-E05-0002	R.5	EPM Internal Cable schedule

2. TESTING STRATEGY

The testing strategy includes the following two phases.

The **Installation** testing phase is developed to test the:

- Documentation;
- Mechanical installation ;
- Electrical installation.

The **Functioning** testing phase is developed to test the functioning of the:

- Electrical equipment

3. INSTALLATION TESTING.

3.1 Documentation check.

3.1	Documentation check.			
	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.		
	Acceptance criteria	All the documentation listed on chapter 1.2 of the FAT procedure have to be present.		
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

3.2 INSTALLATION CHECK

3.2.1	Earthing connections.				
	Aim	Check the earthing connections (wiring and tightening).			
	Pre-requisites	N.A.			
	Test description	Visual inspection and tightening test (with a screw driver or a wrench).			
	Acceptance criteria	The earthing connections must be in compliance with the following documents: **01251-100-S07-E10-0004 UPS Single & Wiring Diagram** **01251-100-S07-E99-0009 Earthing System Internal External Layout**			
	Instrument	Screw driver, Wrench.			
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

3.2.2	UPS Cleanliness of the equipment				
	Aim	Check the cleanliness of the equipment.			
	Pre-requisites	N.A.			
	Test description	Visual inspection.			
	Acceptance criteria				
	Instrument	N.A.			
	Notes				
	Executed	☑ Yes ☐ No	Result	☑ Positive	☐ Negative
	Date	Supplier	Customer	Client	
	17-07-21	[signature]	[signature]	[signature]	

Remote sequence

Push the little grey button sited on the left side of the drawer (as indicated by the relevant label "STARTING OPERETION) in order to let you insert the operating key into the incoming power connector switch rotary handle	
Insert the key; press and rotate 180° clockwise to "I" position to insert the incoming power connector switch	
Remove the key from the left side rotary handle	
Insert the key in the right side rotary handle, press and rotate 90° clockwise to "I" position; the main incoming circuit breaker is closed and the unit is now operating	
Turn in **"REMOTE"** position the selector switch **53SA1** to let command remotely the motor starter. The **"REMOTE"** position allows the command of the motor from a local pushbutton installed at site near the motor. The local pushbutton is equipped with: ✓ **54SA1**, 3 Position selector switch **"HAND-0-AUTO"** ✓ **54SB2**, Start pushbutton ✓ **54SB1**, Stop pushbutton **"Hand"** position With the selector switch in **"HAND"** position the operator can start and stop the motor by a relevant Start and Stop pushbuttons installed on the local pushbutton. The start command is under the authorization from the DCS by digital contact "Permission" The stop command from DCS and the ESD stop are always in operation. Turning the selector switch 54SA1 on the local pushbutton in "0" position the motor stop The mushroom Stop pushbutton on the drawer (emergency Stop) is always in operation **"Auto"** position command by DCS (star/stop digital contact) With the selector switch in **"AUTO"** position the start and stop command of the motor is controlled from DCS by a digital contact The stop command from DCS and the ESD stop are always in operation. The stop pushbutton is always in operation. Turning the selector switch 54SA1 on the local pushbutton in "0" position the motor stop The mushroom Stop pushbutton on the drawer (emergency Stop) is always in operation	

<table>
<tr><td rowspan="9">3.2.3</td><td colspan="4">Mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc..</td></tr>
<tr><td>Aim</td><td colspan="3">Check the functioning of the mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc..</td></tr>
<tr><td>Pre-requisites</td><td colspan="3">N.A.</td></tr>
<tr><td>Test description</td><td colspan="3">Functional test of all the mechanical and electrical interlocks.</td></tr>
<tr><td>Acceptance criteria</td><td colspan="3">All the mechanical and electrical interlocks described on the following documents must be operative:
The UPS arrangement must be in compliance with the following documents:
01251-100-S07-E10-0004 UPS Single & Wiring Diagram
01251-100-S07-E02-0004 UPS Overall Dimension Panel Layout</td></tr>
<tr><td>Instrument</td><td colspan="3">N.A.</td></tr>
<tr><td>Notes</td><td colspan="3"></td></tr>
<tr><td>Executed</td><td>☒ Yes ☐ No</td><td>Result ☒ Positive</td><td>☐ Negative</td></tr>
<tr><td>Date
17-07-21</td><td>Supplier
[signature]</td><td>Customer
[signature]</td><td>Client
[signature]</td></tr>
</table>

3.3 POWER SUPPLY CHECK

3.3.1	Main circuits Power supply			
	Aim	Check the main circuits power supply.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the value of the main power supply voltage.		
	Acceptance criteria	The main circuits power supply voltage should be 400V 3P+N 50Hz.		
	Instrument	Type: HT ITALIA Mod.: HT 8100 S/N: 09600599 Test Certificate: 7544		
	Measured voltage	Value: 400V	Frequency	50HZ
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

3.3.2	Auxiliary circuits Power supply			
	Aim	Check the auxiliary circuits power supply.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the value of the auxiliary power supply voltage.		
	Acceptance criteria	The auxiliary circuits power supply voltage should be 230V 1P+N 50Hz.		
	Instrument	Type: HT ITALIA Mod.: HT 8100 S/N: 09600599 Test Certificate: 7544		
	Measured voltage	Value: 230V	Frequency	50HZ
	Notes			
	Executed	☑ Yes ☐ No	Result	☑ Positive ☐ Negative
	Date	Supplier	Customer	Client
	17-07-21	[signature]	[signature]	[signature]

4. FUNCTIONAL TESTING.

4.1 Electrical equipment.

<table>
<tr><td rowspan="9">4.1.</td><td colspan="4">UPS operating conditions.</td></tr>
<tr><td>Aim</td><td colspan="3">Check the functioning of the UPS</td></tr>
<tr><td>Pre-requisites</td><td colspan="3">N.A.</td></tr>
<tr><td>Test description</td><td colspan="3">Check the circuit breaker, signal lamps and verify the output distribution</td></tr>
<tr><td>Acceptance criteria</td><td colspan="3">The electrical functioning of the UPS must be in compliance with the following document:
01251-100-S07-E10-0004 UPS Single & Wiring Diagram</td></tr>
<tr><td>Notes</td><td colspan="3"></td></tr>
<tr><td>Executed</td><td>☑ Yes ☐ No</td><td>Result</td><td>☑ Positive ☐ Negative</td></tr>
<tr><td>Date</td><td>Supplier</td><td>Customer</td><td>Client</td></tr>
<tr><td>17-07-21</td><td>[signature]</td><td>[signature]</td><td>[signature]</td></tr>
</table>

5 COMMISSIONING AND START-UP PROCEDURES UPS PANEL

5.1 Preliminary operation

The UPS panel provide to fed the auxiliary and command circuit of the LVSWG MCC panel the power supply of the F&G panel, the supply for external shut down valve and the Tank Radar Gauging.
The UPS is powered from the Enppi UPS Substation so as to guarantee continuity of power supply even in the event of a power loss.

Before starting-up the electrical and instrumentation commissioning of UPS Panel all connection with the other panel will be terminated and all the followings point should be checked and confirmed:
The circuit breakers of the others panel connected to the UPS panel must be in open position.

Each circuit is controlled by the relevant circuit breaker.

5.1.1. Mechanical assembling

	Check equipment's alignment	☑
	Check all bolts fixing	☑

5.1.2 Electrical / Instrument connecting

	Check cabling connection	☑
	Check insulated test of cabling system before energizing on the outgoing	☑

After confirmation, the UPS Panel is ready for electrical test without voltage supply
Field test check
Check and Test without voltage supply

Before energising the system, all the followings point should be checked and confirmed:

	Check earthing system connection from the external grounding system to the Indoor Power Distribution Panel ground bar (PE bar).	☑
	Check and/or set all electrical protection as per the wiring diagram	☑

After confirmation, the UPS Panel is ready for electrical and instrument test with power supply.

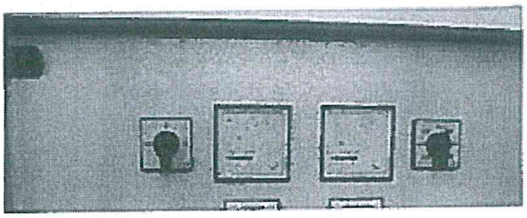
5.1.3 Check and Test with Voltage supply

Before energizing the indoor panel, all breaker must be open.

Require to Enppi supervisor to close the power circuit breaker in the UPS Substation and verify the voltage value.

The verification and the connection of the power supply cable is in charge to Enppi

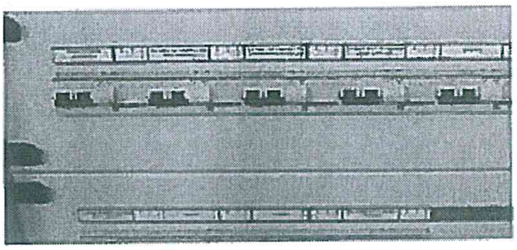
The UPS panel is provided with the following measuring control (see picture):



-Main circuit breaker
-Ammeter and relevant ammeter switch
-Voltmeter and relevant voltmeter switch

5.1.4 Test the circuit one by one and not at the same time in order to check correctly

Each lighting circuit is controlled by the relevant switch breaker, each breaker is equipped with 3 signal lamps green "OFF", red "ON", yellow "FAULT".



The next description includes the action for each section step by step.
For the function of each circuit breaker (Refer to the 01251-100-S07-E10-0003 Outdoor Panel Single Line and Wiring Diagram)

The operation is the following:

Check the voltage supply on the 3 P+N on the Voltmeter PV1 by the voltmeter switch SV 1 close the fuse switch QU1.1
Check by the Lamp Test SB1 the correct function of the signal lamp Close the breaker QF 1.1 and supply the aux. transformer for signal lamp.
Close the Main Circuit breaker QF1
By the signal lamp HL1.1/2.1/3.1 check the status of main circuit breaker
Close the Circuit Breaker QF 2 to QF 12 step by step to supply all circuit and check the output voltage by voltmeter. For each circuit breaker are provided the following signal lamp: -Red Lamp Circuit breaker close -Green Lamp Circuit breaker open -Yellow Lamp Fault

LEGEND
X = ACTIVATION
M = OUTPUT ACTIVATION IN MANUAL MODE ONLY THROUGH MANUAL RELEASE
T1 = TIMED OUTPUT (ACTIVATION AFTER 30secs TIME DELAY) FOR AUTOMATIC RELEASE, FOR MANUAL RELEASE ACTIVATION IS IMMEDIATE
I = OUTPUT INHIBITED
O = SOLENOID SELECTED READY TO BE ACTIVATED IN CASE OF CONFIRMED FIRE 2ooN, MANUAL RELEASE STATION PULLED
S = ONCE ABORT SWITCH IS ACTIVATED, OUTPUT IS INHIBITED AND THE TIMER WILL RESET TO T=0 ONCE THE ABORT SWITCH IS RELEASED, THE TIMER WILL START FROM T=1 AND AFTER 30seconds, THE SYSTEM WILL DISCHARGE

FIRE & GAS DETECTION

Initiator location	Initiator Tag n°	Notes	Initiator Service	F&G Layout	Logic Block		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	REV
					Actuator Tag n°		As per Input Tag	HS-001	BE-004	HS-002	HS-004	BE-003	HO-005	HS-003	HS-007	HS-005	HS-006				UY-001	UY-002			XO-001	XO-002	XO-003	XO-004	XO-005	XO-006	XO-007	XO-008																							
					Notes		Simplex Panel	GAS ALARM	GAS ALARM	FIRE ALARM	FIRE ALARM	FIRE ALARM	F&G ALARM	EXTINGUISHING ALARM	EXTINGUISHING ALARM	EXTINGUISHING ALARM	EXTINGUISHING ALARM				T1	T1			Output Signal	Output Signal	Output Signal	Output Signal	Output Signal	Output Signal	Output Signal	Output Signal																							
					Actuator Service		Event visualized on Display	Combined Horn & Strobe Inside LV SWGR Room	Strobe Outside LV SWGR Room	Combined Horn & Strobe Inside LV SWGR Room	Combined Horn & Strobe Inside TRAFO Room	Strobe Outside LV SWGR Room	Horn Outside LV SWGR Room	Combined Horn & Strobe Inside LV SWGR Room	Combined Horn & Strobe Outside LV SWGR Room	Combined Horn & Strobe Inside Trafo Room	Combined Horn & Strobe Outside Trafo Room				NOVEC System - Main Solenoid	NOVEC System - Reserve Solenoid			Common Fire Alarm (LV SWGR Room or Trafo Room)	Confirmed Fire Alarm (LV SWGR Room or Trafo Room)	Novec System Cylinder Empty (LV SWGR Room or Trafo Room)	Gas Alarm (LV SWGR Room or Trafo Room)	Common Trouble Alarm (LV SWGR Room or Trafo Room)	Supervisory Alarm (System not in Auto)	Extinguishing Alarm (LV SWGR Room or Trafo Room)	HVAC Shutdown																							
								01251-100-807-C66-0027	01251-100-807-C66-0027	01251-100-807-C66-0027	01251-100-807-C66-0027	01251-100-807-C66-0027	01251-100-807-C66-0027	01251-100-807-C66-0027	01251-100-807-C66-0027	01251-100-807-C66-0027	01251-100-807-C66-0027				01251-100-807-A36-0002	01251-100-807-A36-0002			01251-100-807-C66-0027	01251-100-807-C66-0027	01251-100-807-C66-0027	01251-100-807-C66-0027	01251-100-807-C66-0027	01251-100-807-C66-0027	01251-100-807-C66-0027	01251-100-807-C66-0027																							
HVAC	GD-001	25%	CH4 Flammable Gas Detector	01251-100-807-C66-0027	H	01	X	X	X				X															X																											1
HVAC	GD-001	50%	CH4 Flammable Gas Detector	01251-100-807-C66-0027	HH	02	X	X	X				X															X																											1
						03																																																	1
HVAC	GD-002	25%	CH4 Flammable Gas Detector	01251-100-807-C66-0027	H	04	X	X	X				X															X																											1
HVAC	GD-002	50%	CH4 Flammable Gas Detector	01251-100-807-C66-0027	HH	05	X	X	X				X															X																											1
						06																																																	1
HVAC			Two Flammable Gas Detectors at HVAC	01251-100-807-C66-0027	Voting 2oo2 HH	07		X	X				X															X				X																							1
						08																																																	1
HVAC	SD-005	2	Addressable Smoke DUCT Detector	01251-100-807-C66-0027	1oo1	09	X																									X																							1
HVAC	SD-006	2	Addressable Smoke DUCT Detector	01251-100-807-C66-0027	1oo1	10	X																									X																							1
						11																																																	1
						12																																																	1
Trafo Room	HD-001		Addressable Heat Detector	01251-100-807-C66-0027	1oo1	13	X			X	X	X	X												X																														1
Trafo Room	HD-002		Addressable Heat Detector	01251-100-807-C66-0027	1oo1	14	X			X	X	X	X												X																														1
Trafo Room			BOTH OF ABOVE HEAT DETECTORS IN ALARM	01251-100-807-C66-0027	Voting 2oo2	15				X	X	X	X	X	X	X	X				X	X			X	X						X																							1
						16																																																	1
LV SWGR Room	SD-001		Addressable Smoke Detector	01251-100-807-C66-0027	1oo1	17	X			X	X	X	X												X																														1
LV SWGR Room	SD-002		Addressable Smoke Detector	01251-100-807-C66-0027	1oo1	18	X			X	X	X	X												X																														1
LV SWGR Room	SD-003	2	Addressable Smoke Detector	01251-100-807-C66-0027	1oo1	19	X			X	X	X	X												X																														1
LV SWGR Room	SD-004	2	Addressable Smoke Detector	01251-100-807-C66-0027	1oo1	20	X			X	X	X	X												X																														1
LV SWGR Room			ANY 2 FIRE OF ABOVE SMOKE DETECTORS IN ALARM	01251-100-807-C66-0027	Voting 2oo4	21				X	X	X	X	X	X	X	X				X	X			X	X						X																							1
						22																																																	1
LV SWGR Room	MR-001		MANUAL RELEASE	01251-100-807-C66-0027	1oo1	23	X			X	X	X	X	X	X	X	X				X	X				X						X																							1
Trafo Room	MR-002		MANUAL RELEASE	01251-100-807-C66-0027	1oo1	24	X			X	X	X	X	X	X	X	X				X	X				X						X																							1
LV SWGR Room	AB-001		ABORT PUSH BUTTON	01251-100-807-C66-0027	1oo1	25	X														S	S																																	1
Trafo Room	AB-002		ABORT PUSH BUTTON	01251-100-807-C66-0027	1oo1	26	X														S	S																																	1
						27																																																	1
Front F&G Panel	MRS-001		SYSTEM SELECTOR SWITCH MAIN BANK SELECTED	01251-100-807-C66-0027		28															O																																		1
Front F&G Panel	MRS-001		SYSTEM SELECTOR SWITCH RESERVE BANK SELECTED	01251-100-807-C66-0027		29	X															O																																	1
						30																																																	1
Status Panel Outside Airlock	XL-001		System in AUTO Mode	01251-100-807-C66-0027		31																																																	1
Status Panel Outside Airlock	XL-001		System in MANUAL Mode	01251-100-807-C66-0027		32	X														M	M								X																									1
Status Panel Outside Airlock	XL-001		System in INHIBIT Mode	01251-100-807-C66-0027		33	X														I	I								X																									1
						34																																																	1
NOVEC System	ZS-001		Tamper Switch Solenoid Main	01251-100-807-A36-0002		35	X														I									X																									1
NOVEC System	ZS-002		Tamper Switch Solenoid Reserve	01251-100-807-A36-0002		36	X															I								X																									1
NOVEC System	PAL-001		PRESSURE SWITCH LOW - Main Bank	01251-100-807-A36-0002		37	X														I						X																												1
NOVEC System	PAL-002		PRESSURE SWITCH LOW - Reserve Bank	01251-100-807-A36-0002		38	X															I					X																												1
NOVEC System	PAH-001		PRESSURE SWITCH HIGH	01251-100-807-A36-0002		39	X			X	X	X	X	X	X	X	X														X	X																							1
						40																																																	1
Input From Client	XI-001		Remote Novec Actuation Signal From MFACP (LV room and Transformer room)			41	X			X	X	X	X	X	X	X	X				X	X										X																							1
						42																																																	1
						43																																																	1
	...		ANY ONE FAULT OF ABOVE DEVICES			44	X																						X																										1
						45																																																	1

NOTES:
1) For Maintenance Purpose in front of the F&G Panel is installed the Key Maintenance Switch KMS-001, to allow the system to be tested without actuating the fire suppression system. The Maintenance Switch disconnect phisically the solenoid circuit, when activated a Fault signal will appear on the system.
2) Addressable Smoke DUCT Detectors and Smoke Detectors installed under false floor are equipped with remote Indicator LED.
3) Fire Tone: 544Hz (100ms)/440Hz (400ms) / Gas Tone: Continuous 544Hz / Pre-Discharge: March Tone - Coded Signal / Discharged 1000Hz (For Extinguishing Combined Horn/Beacon the change Tone is Achieved through Software Programming)

M. Gad
27/7/2021

PPC
M. Omar

27/07/2021

Enppi

EGPC - THE EGYPTIAN GENERAL PETROLEUM CORPORATION
CRUDE OIL TANK FARM 1251-100

VENDOR Doc. No.	CLIENT Doc. No.	
C20-003-FG-021	01251-100-807-A36-0001	
DATE	REVISION	PAGE
04/08/2020	2	2 / 2

6 FINAL CERTIFICATION

After SAT completion, check that all related documents are red marked up for future revision, fully fill-in, properly signed and traced with relevant attachments.

ACCEPTANCE CERTIFICATE		
THE UNDERSIGNED HAS INSPECTED AND PERFORMED SELECTED TESTS WITHIN THIS DOCUMENT AND ACCEPTS THAT THE PRODUCED UNDER THE P.O.: DATED: HAS BEEN TESTED AS PER SPECIFICATION AND MEETS THE REQUIREMENTS OF CLIENT		
M. Gamal FOR CONTRACTOR	M. omar FOR CLIENT	FOR VENDOR
27/7/2021 DATE		27.07.2021

7 FINAL TEST REPORT

Enppi		CEAR
DATE 30/10/2020	REVISION 0	PAGE 1 of 1

TEST REPORT

OBJECT OF THE TEST:

COMMISSIONING SAT TEST_________TAG EPM 030-EPM-02

REFERENCE DOC:

INSPECTION & TEST PLAN 01251-100-S07-P12-0007

SAT F&G 01251-100-S07-P06-0006

LEGEND:

NA: Not Applicable	P: Pending	S: Satisfactory

FIRE DETECTION AND ALARM SYSTEM

POS	DESCRIPTION	SAT NA	SAT P	SAT S	PENDING N°
A.1	Visual and dimensional check			✓	
A.2	Wiring insulation and continuity test			✓	
4.1	Workmanship Material, Surface defects, components and general finish			✓	
4.2	Mark tagging and conformance to packing requirements			✓	
4.3	Hardware functionality			✓	
4.4	Software functionality			✓	
4.5	Site acceptance integration test			✓	
4.6	Power supply interruption test			✓	

Enppi Representative	Cear Representative	Date
	[signature]	PPC M. omar

REMARKS

SD-006 (Duct smoke detector) had not any response
the interface signal X-005 (common trouble alarm) was not working and had no response also
all resistor required for line monitor reconnected for all interface signal.

01251-100-S07-P06-0006 R.2

M. Gamal
27/7/2021

Enppi | **EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.** | CEAR

Enppi		CEAR
DATE 30/10/2020	REVISION 0	PAGE 1 of 1

TEST REPORT

OBJECT OF THE TEST:

COMMISSIONING SAT TEST________TAG EPM ~~03~~ EPM-02

REFERENCE DOC:

INSPECTION & TEST PLAN 01251-100-S07-P12-0007

SAT F&G 01251-100-S07-P06-0006

LEGEND:

NA: Not Applicable	P: Pending	S: Satisfactory

FIRE FIGHTING SYSTEM

POS	DESCRIPTION	SAT NA	SAT P	SAT S	PENDING N°
8.1	Visual and dimensional check			✓	
5.1	Workmanship Material, Surface defects, components and general finish			✓	
5.2	Mark tagging and conformance to packing requirements			✓	
5.3	Pneumatic test			✓	
5.4	Leakage test for storage cylinders			✓	
5.5	Operation / pressure test (manifold pressure switch)			✓	
5.6	Electrical control head and components wiring check			✓	
5.7	Simulation test			✓	
5.7	Room Integrity test		✓		

Enppi Representative	Cear Representative	PPC Date
	[signature]	m. omar

REMARKS

room integrity test was not tested

System ID	030-EL-018
System Description	Electrical Power Module-2 System

12.10- Electrical Pre-Commissioning Check Lists

Enppi

PRE-COMMISSIONING CHECK LIST
MEDIUM VOLTAGE CABLES
EL-31 A

PROJECT TITLE	: EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)		
PROJECT NUMBER	: 1251-100	**DISCIPLINE**	: Electrical
SYSTEM NAME	: Electrical Power Module-2 System	**SYSTEM ID**	: 030-EL-018
SUB-SYSTEM NAME	: Electrical Power Module-2 System	**SUB-SYSTEM ID**	: 030-EL-018
ITEM TAG No.	: P-030-EPM2-TR-1	**AREA**	: 30
REF. DWGs/DOCs	:		

No.	DESCRIPTION	RESULT OK/NA/PL	PL ITEM No.
1	Construction punch list to be checked.	✓	
2	Check cables are correctly fixed to trays and supports.	✓	
3	Check cables through walls or ceilings are correctly sealed.	✓	
4	Check that all cables are installed in accordance with cable lists and approved documents.	✓	
5	Check identification tags of all conductors and wires.	✓	
6	Check connection, termination and joints of cables are correctly executed.	✓	
7	Inspect cables for jacket damage.	✓	
8	Ensure that the correct size and type of crimping lugs have been used.	✓	
9	Check that the bending radius of cables is not less than the minimum established.	✓	
10	Cable markers to be installed before covering buried cables or cables in cable trays.	✓	
11	Tie wraps to be used for cable and wires fixation.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	CONST. CONTRACTOR	ENPPI	CUSTOMER
NAME		® Islam Sherif	
SIGNATURE	[signature]	[signature]	[signature]
DATE			

10000-Z-000-EK7-TMP-0017 (03/14)

Enppi

PRE-COMMISSIONING CHECK LIST
MEDIUM VOLTAGE CABLES
EL-31 A

PROJECT TITLE	: EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)		
PROJECT NUMBER	: 1251-100	**DISCIPLINE**	: Electrical
SYSTEM NAME	: Electrical Power Module-2 System	**SYSTEM ID**	: 030-EL-018
SUB-SYSTEM NAME	: Electrical Power Module-2 System	**SUB-SYSTEM ID**	: 030-EL-018
ITEM TAG No.	: P-030-EPM2-TR-1	**AREA**	: 30
REF. DWGs/DOCs	:		

No.	DESCRIPTION	RESULT OK/NA/PL	PL ITEM No.
12	Trench markers to be checked w.r.t approved documents.	✓	
13	Check cable glands for tightness and check the correct type of gland has been used for the size and type of installed cables.	✓	
14	Inspect cable laid in trenches, segregation and protection.	✓	
15	Cables to be tested (continuity/insulation resistance).(*)	✓	
16	Equipment test report and inspection certificate to be-checked.	✓	
17	Check availability of vendor documents, including commissioning and start-up instructions. (If Any)	N/A	
18	Calibration test certificate of testing equipment to be checked.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	CONST. CONTRACTOR	ENPPI	CUSTOMER
NAME		Islam Sherif	
SIGNATURE	[signature]	[signature]	[signature]
DATE			

Enppi

PRE-COMMISSIONING CHECK LIST
MEDIUM VOLTAGE CABLES
EL-31 A

INSULATION TEST

EL-31 A

CABLE VOLTAGE LEVEL	D.C TEST VOLTAGE	MINIMUM INSULATION RESISTANCE (M.OHMS).
3.3kV	2500V	200
6.6kV & Above	5000V	200

TABLE [I]

NOTES:

Enppi

PRE-COMMISSIONING CHECK LIST
MEDIUM VOLTAGE CABLES
EL-31 A

PROJECT TITLE	: EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)		
PROJECT NUMBER	: 1251-100	**DISCIPLINE**	: Electrical
SYSTEM NAME	: Electrical Power Module-2 System	**SYSTEM ID**	: 030-EL-018
SUB-SYSTEM NAME	: Electrical Power Module-2 System	**SUB-SYSTEM ID**	: 030-EL-018
ITEM TAG No.	: C-030-EPM2-LVSWG	**AREA**	: 30
REF. DWGs/DOCs	:		

No.	DESCRIPTION	RESULT	PL
		OK/NA/PL	ITEM No.
1	Construction punch list to be checked.	✓	
2	Check cables are correctly fixed to trays and supports.	✓	
3	Check cables through walls or ceilings are correctly sealed.	✓	
4	Check that all cables are installed in accordance with cable lists and approved documents.	✓	
5	Check identification tags of all conductors and wires.	✓	
6	Check connection, termination and joints of cables are correctly executed.	✓	
7	Inspect cables for jacket damage.	✓	
8	Ensure that the correct size and type of crimping lugs have been used.	✓	
9	Check that the bending radius of cables is not less than the minimum established.	✓	
10	Cable markers to be installed before covering buried cables or cables in cable trays.	✓	
11	Tie wraps to be used for cable and wires fixation.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	CONST. CONTRACTOR	ENPPI	CUSTOMER
NAME		® Islam Sherif	
SIGNATURE	[signature]	[signature]	[signature]
DATE			

Enppi

PRE-COMMISSIONING CHECK LIST
MEDIUM VOLTAGE CABLES
EL-31 A

PROJECT TITLE	: EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)		
PROJECT NUMBER	: 1251-100	**DISCIPLINE**	: Electrical
SYSTEM NAME	: Electrical Power Module-2 System	**SYSTEM ID**	: 030-EL-018
SUB-SYSTEM NAME	: Electrical Power Module-2 System	**SUB-SYSTEM ID**	: 030-EL-018
ITEM TAG No.	: C-030-EPM2-LVSWG	**AREA**	: 30
REF. DWGs/DOCs	:		

No.	DESCRIPTION	RESULT OK/NA/PL	PL ITEM No.
12	Trench markers to be checked w.r.t approved documents.	✓	
13	Check cable glands for tightness and check the correct type of gland has been used for the size and type of installed cables.	✓	
14	Inspect cable laid in trenches, segregation and protection.	✓	
15	Cables to be tested (continuity/insulation resistance).(*)	✓	
16	Equipment test report and inspection certificate to be-checked.	✓	
17	Check availability of vendor documents, including commissioning and start-up instructions. (If Any)	N/A	
18	Calibration test certificate of testing equipment to be checked.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	CONST. CONTRACTOR	ENPPI	CUSTOMER
NAME		Islam Sherif	
SIGNATURE	[signature]	[signature]	[signature]
DATE			

Enppi

PRE-COMMISSIONING CHECK LIST
MEDIUM VOLTAGE CABLES
EL-31 A

INSULATION TEST

EL-31 A

CABLE VOLTAGE LEVEL	D.C TEST VOLTAGE	MINIMUM INSULATION RESISTANCE (M.OHMS).
3.3kV	2500V	200
6.6kV & Above	5000V	200

TABLE [I]

NOTES:

Enppi

PRE-COMMISSIONING CHECK LIST
MEDIUM VOLTAGE CABLES
EL-31 A

PROJECT TITLE	: EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)		
PROJECT NUMBER	: 1251-100	**DISCIPLINE**	: Electrical
SYSTEM NAME	: Electrical Power Module-2 System	**SYSTEM ID**	: 030-EL-018
SUB-SYSTEM NAME	: Electrical Power Module-2 System	**SUB-SYSTEM ID**	: 030-EL-018
ITEM TAG No.	: P-030-EPM2-UPDP-1	**AREA**	: 30
REF. DWGs/DOCs	:		

No.	DESCRIPTION	RESULT OK/NA/PL	PL ITEM No.
1	Construction punch list to be checked.	✓	
2	Check cables are correctly fixed to trays and supports.	✓	
3	Check cables through walls or ceilings are correctly sealed.	✓	
4	Check that all cables are installed in accordance with cable lists and approved documents.	✓	
5	Check identification tags of all conductors and wires.	✓	
6	Check connection, termination and joints of cables are correctly executed.	✓	
7	Inspect cables for jacket damage.	✓	
8	Ensure that the correct size and type of crimping lugs have been used.	✓	
9	Check that the bending radius of cables is not less than the minimum established.	✓	
10	Cable markers to be installed before covering buried cables or cables in cable trays.	✓	
11	Tie wraps to be used for cable and wires fixation.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	CONST. CONTRACTOR	ENPPI	CUSTOMER
NAME		® Islam Sherif	
SIGNATURE	Sobh [signature]	[signature]	[signature]
DATE			

Enppi

PRE-COMMISSIONING CHECK LIST
MEDIUM VOLTAGE CABLES
EL-31 A

PROJECT TITLE	: EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)		
PROJECT NUMBER	: 1251-100	**DISCIPLINE**	: Electrical
SYSTEM NAME	: Electrical Power Module-2 System	**SYSTEM ID**	: 030-EL-018
SUB-SYSTEM NAME	: Electrical Power Module-2 System	**SUB-SYSTEM ID**	: 030-EL-018
ITEM TAG No.	: P-030-EPM2-UPDP-1	**AREA**	: 30
REF. DWGs/DOCs	:		

No.	DESCRIPTION	RESULT OK/NA/PL	PL ITEM No.
12	Trench markers to be checked w.r.t approved documents.	✓	
13	Check cable glands for tightness and check the correct type of gland has been used for the size and type of installed cables.	✓	
14	Inspect cable laid in trenches, segregation and protection.	✓	
15	Cables to be tested (continuity/insulation resistance).(*)	✓	
16	Equipment test report and inspection certificate to be-checked.	✓	
17	Check availability of vendor documents, including commissioning and start-up instructions. (If Any)	N/A	
18	Calibration test certificate of testing equipment to be checked.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	CONST. CONTRACTOR	ENPPI	CUSTOMER
NAME		® Islam Sherif	
SIGNATURE	[signature]	[signature]	[signature]
DATE			

Enppi

PRE-COMMISSIONING CHECK LIST
MEDIUM VOLTAGE CABLES
EL-31 A

INSULATION TEST

EL-31 A

CABLE VOLTAGE LEVEL	D.C TEST VOLTAGE	MINIMUM INSULATION RESISTANCE (M.OHMS).
3.3kV	2500V	200
6.6kV & Above	5000V	200

TABLE [I]

NOTES:

Enppi

PRE-COMMISSIONING CHECK LIST
GASEOUS FIRE EXTINGUISHING SYSTEM
LP-05 A

PROJECT TITLE	: EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)		
PROJECT NUMBER	: 1251-100	**DISCIPLINE**	: Loss Prevention
SYSTEM NAME	: Electrical Power Module-2 System	**SYSTEM ID**	: 030-EL-018
SUB-SYSTEM NAME	: Electrical Power Module-2 System	**SUB-SYSTEM ID**	: 030-EL-018
ITEM TAG No.	: 030XA035	**AREA**	: 30
REF. DWGs/DOCs	: 030XA035		

No.	DESCRIPTION	RESULT OK/NA/PL	PL ITEM No.
1	Check that the piping is installed as per design drawings. i.e. length, size,…etc	NA	
2	Check that the nozzle is properly oriented.	NA	
3	Check that the detection device is in proper location.	NA	
4	Check that the detection device model number as per data sheet.	NA	
5	Check the manual station is properly installed and accessible.	NA	
6	Check all detectors and devices with proper tags.	NA	
7	Check the abort switch is deadman type.	NA	
8	Check that the control unit is properly installed.	✓	
9	Check the control panel wiring termination as per supplier drawings.	✓	
10	Check the control panel is properly identified.	✓	
11	Check the agent container location in correct position.	NA	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE	[signature]	[signature]	M. Omar [signature]
DATE			

10000-Z-000-EK7-TMP-0088 (03/14)

Enppi

PRE-COMMISSIONING CHECK LIST
GASEOUS FIRE EXTINGUISHING SYSTEM
LP-05 A

PROJECT TITLE : EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)	
PROJECT NUMBER : 1251-100	**DISCIPLINE** : Loss Prevention
SYSTEM NAME :Electrical Power Module-2 System	**SYSTEM ID** :030-EL-018
SUB-SYSTEM NAME :Electrical Power Module-2 System	**SUB-SYSTEM ID** :030-EL-018
ITEM TAG No. :030XA035	**AREA** : 30
REF. DWGs/DOCs :030XA035	

No.	DESCRIPTION	RESULT OK/NA/PL	PL ITEM No.
12	Check the agent container are fastened.	NA	
13	Check the container filling arrow pointed to green area.	NA	
14	Check the non retuen valve orientation.	NA	
15	Check the flexible hose installation.	NA	
16	Check the abort switch is deadman type.	NA	
17	Check wiring is properly installed as per drawing.	✓	
18	Check the power supplied for control unit from separate dedicated source.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE	[signature]	[signature]	[signature] M. Omar
DATE			

10000-Z-000-EK7-TMP-0088 (03/14)

Enppi

PRE-COMMISSIONING CHECK LIST
GASEOUS FIRE EXTINGUISHING SYSTEM
LP-05 A

PROJECT TITLE	: EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)		
PROJECT NUMBER	: 1251-100	**DISCIPLINE**	: Loss Prevention
SYSTEM NAME	: Electrical Power Module-2 System	**SYSTEM ID**	: 030-EL-018
SUB-SYSTEM NAME	: Electrical Power Module-2 System	**SUB-SYSTEM ID**	: 030-EL-018
ITEM TAG No.	: 030XA036	**AREA**	: 30
REF. DWGs/DOCs	: 030XA036		

No.	DESCRIPTION	RESULT OK/NA/PL	PL ITEM No.
1	Check that the piping is installed as per design drawings. i.e. length, size,…etc	NA	
2	Check that the nozzle is properly oriented.	NA	
3	Check that the detection device is in proper location.	NA	
4	Check that the detection device model number as per data sheet.	NA	
5	Check the manual station is properly installed and accessible.	NA	
6	Check all detectors and devices with proper tags.	NA	
7	Check the abort switch is deadman type.	NA	
8	Check that the control unit is properly installed.	✓	
9	Check the control panel wiring termination as per supplier drawings.	✓	
10	Check the control panel is properly identified.	✓	
11	Check the agent container location in correct position.	NA	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE	[signature]	[signature]	M. Omar [signature]
DATE			

Enppi

PRE-COMMISSIONING CHECK LIST
GASEOUS FIRE EXTINGUISHING SYSTEM
LP-05 A

PROJECT TITLE : EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)	
PROJECT NUMBER : 1251-100	**DISCIPLINE** : Loss Prevention
SYSTEM NAME :Electrical Power Module-2 System	**SYSTEM ID** :030-EL-018
SUB-SYSTEM NAME :Electrical Power Module-2 System	**SUB-SYSTEM ID** :030-EL-018
ITEM TAG No. :030XA036	**AREA** : 30
REF. DWGs/DOCs :030XA036	

No.	DESCRIPTION	RESULT OK/NA/PL	PL ITEM No.
12	Check the agent container are fastened.	NA	
13	Check the container filling arrow pointed to green area.	NA	
14	Check the non retuen valve orientation.	NA	
15	Check the flexible hose installation.	NA	
16	Check the abort switch is deadman type.	NA	
17	Check wiring is properly installed as per drawing.	✓	
18	Check the power supplied for control unit from separate dedicated source.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE	[signature]	[signature] A. Elmustafa	[signature] M. omar
DATE			

Enppi

PRE-COMMISSIONING CHECK LIST
GASEOUS FIRE EXTINGUISHING SYSTEM
LP-05 A

PROJECT TITLE	: EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)		
PROJECT NUMBER	: 1251-100	**DISCIPLINE**	: Loss Prevention
SYSTEM NAME	: Electrical Power Module-2 System	**SYSTEM ID**	: 030-EL-018
SUB-SYSTEM NAME	: Electrical Power Module-2 System	**SUB-SYSTEM ID**	: 030-EL-018
ITEM TAG No.	: 030XA037	**AREA**	: 30
REF. DWGs/DOCs	: 030XA037		

No.	DESCRIPTION	RESULT OK/NA/PL	PL ITEM No.
1	Check that the piping is installed as per design drawings. i.e. length, size,…etc	NA	
2	Check that the nozzle is properly oriented.	NA	
3	Check that the detection device is in proper location.	NA	
4	Check that the detection device model number as per data sheet.	NA	
5	Check the manual station is properly installed and accessible.	NA	
6	Check all detectors and devices with proper tags.	NA	
7	Check the abort switch is deadman type.	NA	
8	Check that the control unit is properly installed.	✓	
9	Check the control panel wiring termination as per supplier drawings.	✓	
10	Check the control panel is properly identified.	✓	
11	Check the agent container location in correct position.	NA	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE	[signature]	A. ElMosfy [signature]	M. omar [signature]
DATE			

Enppi

PRE-COMMISSIONING CHECK LIST
GASEOUS FIRE EXTINGUISHING SYSTEM
LP-05 A

PROJECT TITLE	: EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)		
PROJECT NUMBER	: 1251-100	**DISCIPLINE**	: Loss Prevention
SYSTEM NAME	:Electrical Power Module-2 System	**SYSTEM ID**	:030-EL-018
SUB-SYSTEM NAME	:Electrical Power Module-2 System	**SUB-SYSTEM ID**	:030-EL-018
ITEM TAG No.	:030XA037	**AREA**	: 30
REF. DWGs/DOCs	:030XA037		

No.	DESCRIPTION	RESULT OK/NA/PL	PL ITEM No.
12	Check the agent container are fastened.	NA	
13	Check the container filling arrow pointed to green area.	NA	
14	Check the non retuen valve orientation.	NA	
15	Check the flexible hose installation.	NA	
16	Check the abort switch is deadman type.	NA	
17	Check wiring is properly installed as per drawing.	✓	
18	Check the power supplied for control unit from separate dedicated source.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE	[signature]	A. Elbatsh [signature]	M. Omar [signature]
DATE			

Enppi

PRE-COMMISSIONING CHECK LIST
GASEOUS FIRE EXTINGUISHING SYSTEM
LP-05 A

PROJECT TITLE	: EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)		
PROJECT NUMBER	: 1251-100	**DISCIPLINE**	: Loss Prevention
SYSTEM NAME	: Electrical Power Module-2 System	**SYSTEM ID**	: 030-EL-018
SUB-SYSTEM NAME	: Electrical Power Module-2 System	**SUB-SYSTEM ID**	: 030-EL-018
ITEM TAG No.	: 030XA038	**AREA**	: 30
REF. DWGs/DOCs	: 030XA038		

No.	DESCRIPTION	RESULT OK/NA/PL	PL ITEM No.
1	Check that the piping is installed as per design drawings. i.e. length, size,…etc	NA	
2	Check that the nozzle is properly oriented.	NA	
3	Check that the detection device is in proper location.	NA	
4	Check that the detection device model number as per data sheet.	NA	
5	Check the manual station is properly installed and accessible.	NA	
6	Check all detectors and devices with proper tags.	NA	
7	Check the abort switch is deadman type.	NA	
8	Check that the control unit is properly installed.	✓	
9	Check the control panel wiring termination as per supplier drawings.	✓	
10	Check the control panel is properly identified.	✓	
11	Check the agent container location in correct position.	NA	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE	[signature]	A. Elwish [signature]	M. Omar [signature]
DATE			

Enppi

PRE-COMMISSIONING CHECK LIST
GASEOUS FIRE EXTINGUISHING SYSTEM
LP-05 A

PROJECT TITLE	: EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)		
PROJECT NUMBER	: 1251-100	**DISCIPLINE**	: Loss Prevention
SYSTEM NAME	:**Electrical Power Module-2 System**	**SYSTEM ID**	:**030-EL-018**
SUB-SYSTEM NAME	:**Electrical Power Module-2 System**	**SUB-SYSTEM ID**	:**030-EL-018**
ITEM TAG No.	:**030XA038**	**AREA**	: 30
REF. DWGs/DOCs	:**030XA038**		

No.	DESCRIPTION	RESULT OK/NA/PL	PL ITEM No.
12	Check the agent container are fastened.	NA	
13	Check the container filling arrow pointed to green area.	NA	
14	Check the non retuen valve orientation.	NA	
15	Check the flexible hose installation.	NA	
16	Check the abort switch is deadman type.	NA	
17	Check wiring is properly installed as per drawing.	✓	
18	Check the power supplied for control unit from separate dedicated source.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE	[signature]	[signature]	M. omar
DATE			

Enppi

PRE-COMMISSIONING CHECK LIST
GASEOUS FIRE EXTINGUISHING SYSTEM
LP-05 A

PROJECT TITLE	: EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)		
PROJECT NUMBER	: 1251-100	**DISCIPLINE**	: Loss Prevention
SYSTEM NAME	: Electrical Power Module-2 System	**SYSTEM ID**	: 030-EL-018
SUB-SYSTEM NAME	: Electrical Power Module-2 System	**SUB-SYSTEM ID**	: 030-EL-018
ITEM TAG No.	: 030XA039	**AREA**	: 30
REF. DWGs/DOCs	: 030XA039		

No.	DESCRIPTION	RESULT OK/NA/PL	PL ITEM No.
1	Check that the piping is installed as per design drawings. i.e. length, size,…etc	NA	
2	Check that the nozzle is properly oriented.	NA	
3	Check that the detection device is in proper location.	NA	
4	Check that the detection device model number as per data sheet.	NA	
5	Check the manual station is properly installed and accessible.	NA	
6	Check all detectors and devices with proper tags.	NA	
7	Check the abort switch is deadman type.	NA	
8	Check that the control unit is properly installed.	✓	
9	Check the control panel wiring termination as per supplier drawings.	✓	
10	Check the control panel is properly identified.	✓	
11	Check the agent container location in correct position.	NA	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE	[signature]	[signature]	M. Omar
DATE			

10000-Z-000-EK7-TMP-0088 (03/14)

Enppi

PRE-COMMISSIONING CHECK LIST
GASEOUS FIRE EXTINGUISHING SYSTEM
LP-05 A

PROJECT TITLE	: EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)		
PROJECT NUMBER	: 1251-100	**DISCIPLINE**	: Loss Prevention
SYSTEM NAME	**:Electrical Power Module-2 System**	**SYSTEM ID**	**:030-EL-018**
SUB-SYSTEM NAME	**:Electrical Power Module-2 System**	**SUB-SYSTEM ID**	**:030-EL-018**
ITEM TAG No.	**:030XA039**	**AREA**	: 30
REF. DWGs/DOCs	**:030XA039**		

No.	DESCRIPTION	RESULT OK/NA/PL	PL ITEM No.
12	Check the agent container are fastened.	NA	
13	Check the container filling arrow pointed to green area.	NA	
14	Check the non retuen valve orientation.	NA	
15	Check the flexible hose installation.	NA	
16	Check the abort switch is deadman type.	NA	
17	Check wiring is properly installed as per drawing.	✓	
18	Check the power supplied for control unit from separate dedicated source.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE	[signature]	[signature]	[signature] M. Omar
DATE			

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PRE-COMMISSIONING CHECK LIST
GASEOUS FIRE EXTINGUISHING SYSTEM
LP-05 A

PROJECT TITLE	: EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)		
PROJECT NUMBER	: 1251-100	**DISCIPLINE**	: Loss Prevention
SYSTEM NAME	: Electrical Power Module-2 System	**SYSTEM ID**	: 030-EL-018
SUB-SYSTEM NAME	: Electrical Power Module-2 System	**SUB-SYSTEM ID**	: 030-EL-018
ITEM TAG No.	: 030XA040	**AREA**	: 30
REF. DWGs/DOCs	: 030XA040		

No.	DESCRIPTION	RESULT OK/NA/PL	PL ITEM No.
1	Check that the piping is installed as per design drawings. i.e. length, size,…etc	NA	
2	Check that the nozzle is properly oriented.	NA	
3	Check that the detection device is in proper location.	NA	
4	Check that the detection device model number as per data sheet.	NA	
5	Check the manual station is properly installed and accessible.	NA	
6	Check all detectors and devices with proper tags.	NA	
7	Check the abort switch is deadman type.	NA	
8	Check that the control unit is properly installed.	✓	
9	Check the control panel wiring termination as per supplier drawings.	✓	
10	Check the control panel is properly identified.	✓	
11	Check the agent container location in correct position.	NA	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE	[signature]	A. Elwaskey [signature]	M. Omar [signature]
DATE			

Enppi

PRE-COMMISSIONING CHECK LIST
GASEOUS FIRE EXTINGUISHING SYSTEM
LP-05 A

PROJECT TITLE	: EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)		
PROJECT NUMBER	: 1251-100	**DISCIPLINE**	: Loss Prevention
SYSTEM NAME	:Electrical Power Module-2 System	**SYSTEM ID**	:030-EL-018
SUB-SYSTEM NAME	:Electrical Power Module-2 System	**SUB-SYSTEM ID**	:030-EL-018
ITEM TAG No.	:030XA040	**AREA**	: 30
REF. DWGs/DOCs	:030XA040		

No.	DESCRIPTION	RESULT OK/NA/PL	PL ITEM No.
12	Check the agent container are fastened.	NA	
13	Check the container filling arrow pointed to green area.	NA	
14	Check the non retuen valve orientation.	NA	
15	Check the flexible hose installation.	NA	
16	Check the abort switch is deadman type.	NA	
17	Check wiring is properly installed as per drawing.	✓	
18	Check the power supplied for control unit from separate dedicated source.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE	[signature]	[signature]	M. Omar
DATE			

System ID	030-EL-018
System Description	Electrical Power Module-2 System

12.11- Electrical Supplier Check Lists & Reports

System ID	030-EL-018
System Description	Electrical Power Module-2 System

13- Electrical Commissioning

System ID	030-EL-018
System Description	Electrical Power Module-2 System

13.01- Electrical -Commissioning Check Lists

System ID	030-EL-018
System Description	Electrical Power Module-2 System

13.02- Electrical Supplier Check Lists & Reports

System ID	030-EL-018
System Description	Electrical Power Module-2 System

14- Red Marked-up Drawings

System ID	030-EL-018
System Description	Electrical Power Module-2 System

14.01- P&ID

System ID	030-EL-018
System Description	Electrical Power Module-2 System

14.02- Instrumentation Drawings

System ID	030-EL-018
System Description	Electrical Power Module-2 System

14.03- Electrical Drawings